86-675

Supreme Court, U.S.
FILED
OCT 23 1986
JOSEPH F. SPANIOL, JR.
CLERK

NO.

IN THE

SUPREME COURT OF THE UNITED STATES

October Term, 1986

JASLOW DENTAL LABORATORY, INC., EDWARD JASLOW, RAND JASLOW AND DENTCOM, INC.,
Petitioners,

v.

WHELAN ASSOCIATES, INC.,
Respondent.

PETITION FOR A WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE THIRD CIRCUIT

JAMES D. CRAWFORD*
ROBERT S. BRAMSON
MICHAEL J. MANGAN
RONALD E. KARAM
Attorneys for Petitioners.

SCHNADER, HARRISON, SEGAL & LEWIS
Suite 3600
1600 Market Street
Philadelphia, Pennsylvania 19103
(215) 751-2244
Of Counsel.

*Attorney of Record.

1+6 pp

QUESTION PRESENTED

Does Section 102(b) of the Copyright Act — which provides that copyright protection does not extend to a "procedure, process, system, [or] method of operation" — preclude copyright protection for the structure and other nonliteral elements of a computer program that embody the procedures, processes, and methods performed by the program?

TABLE OF CONTENTS

	Page
Question Presented	i
Table of Authorities	iv
Opinions Below	2
Jurisdiction	2
Constitutional and Statutory Provisions Involved	2
Statement of the Case	3
Reasons for Granting the Writ	9
Introduction	9
I. This Case Is of Critical Importance to an Entire Industry and Has Far-Reaching Implications for the Public	10
II. The Court of Appeals Has Engrafted a Judicial Amendment on the Copyright Act Which Overrides Section 102(b)	13
III. The Idea/Expression Test Devised by the Court of Appeals for Computer Programs is Meaningless and Unworkable	21
IV. This Court Should Clarify the Relevance of the Degree of Labor and Effort in Creating a Work to the Scope of Protection of the Work	25
Conclusion	28

TABLE OF CONTENTS—*(Continued)*

Page

APPENDIX:

Court of Appeals Opinion (8/4/86) A1

District Court Opinion (1/22/85) A61

District Court Order (1/21/85) A91

District Court Opinion (5/9/85) A94

District Court Order (5/9/85) A104

District Court Supplemental Order and Final Judgment (11/14/85) A105

Court of Appeals Judgment (8/4/86) A107

Court of Appeals Order (8/29/86) A108

TABLE OF AUTHORITIES

CASES:	Page
Atari, Inc. v. North American Philips Consumer Elecs. Corp., 672 F.2d 607 (7th Cir.), *cert. denied*, 459 U.S. 880 (1982)	19
Baker v. Selden, 101 U.S. 99 (1879)	*passim*
Broderbund Software, Inc. v. Pixellite Software, No. C-85-3457, slip op. (N.D. Cal. Oct. 8, 1986)	21
Continental Casualty Co. v. Beardsley, 253 F.2d 702 (2d Cir.), *cert. denied*, 358 U.S. 816 (1958)	19
Eckes v. Card Prices Update, 736 F.2d 859 (2d Cir. 1984)	26
Gottschalk v. Benson, 409 U.S. 63 (1972)	24
Graham v. John Deere Co., 383 U.S. 1 (1966)	13
Kepner-Tregoe, Inc. v. Carabio, 203 U.S.P.Q. 124 (E.D. Mich. 1979)	19
Landsberg v. Scrabble Crossword Game Players, Inc., 736 F.2d 485 (9th Cir.), *cert. denied*, ____U.S. ____, 105 S. Ct. 513 (1984)	19
Leon v. Pacific Tel. & Tel. Co., 91 F.2d 484 (9th Cir. 1937)	27
Miller v. Universal City Studios, Inc., 650 F.2d 1365 (5th Cir. 1981)	26
Nichols v. Universal Pictures, 45 F.2d 119 (2d Cir. 1930), *cert. denied*, 282 U.S. 902 (1931)	15
Peter Pan Fabrics, Inc. v. Martin Weiner Corp., 274 F.2d 487 (2d Cir. 1960)	15
Rockford Map Publishers, Inc. v. Directory Service Co. of Colorado, Inc., 768 F.2d 145 (7th Cir. 1985), *cert. denied*, ____U.S. ____, 106 S. Ct. 806 (1986)	27

TABLE OF AUTHORITIES—*(Continued)*

CASES: **Page**

Schroeder v. William Morrow & Co., 566 F.2d 3 (7th Cir. 1977) 27

Stern Elecs., Inc. v. Kaufman, 669 F.2d 852 (2d Cir. 1982) 5

Twentieth Century-Fox Film Corp. v. MCA, Inc., 715 F.2d 1327 (9th Cir. 1983)..... 19

West Publishing Co. v. Mead Data Central, Inc., 799 F.2d 1219 (8th Cir. 1986)..... 27

Whelan Associates, Inc. v. Jaslow Dental Laboratory, Inc., 609 F. Supp. 1307 (E.D. Pa. 1985) ..... *passim*

Whelan Associates, Inc. v. Jaslow Dental Laboratory, Inc., 609 F. Supp. 1325 (E.D. Pa. 1985)..... 2, 8

Whelan Associates, Inc. v. Jaslow Dental Laboratory, Inc., 797 F.2d 1222 (3d Cir. 1986) ..... *passim*

Williams v. Arndt, 626 F. Supp. 571 (D. Mass. 1985).... 21

Williams Elecs., Inc. v. Artic Int'l, Inc., 685 F.2d 870 (3d Cir. 1982) 5

CONSTITUTION, STATUTES, AND LEGISLATIVE MATERIALS:

U.S. Const. art. I, § 8, cl. 8 ..... 2, 9

COPYRIGHT ACT

17 U.S.C. § 101..... 14

17 U.S.C. § 102(a)..... 2, 14, 17

17 U.S.C. § 102(b) ..... *passim*

JUDICIAL CODE

28 U.S.C. § 1254(1)..... 2

28 U.S.C. § 1338..... 7

LEGISLATIVE MATERIALS

H.R. Rep. No. 1476, 94th Cong., 2d Sess. 56-57, *reprinted in* 1976 U.S. Code Cong. & Admin. News 56, 59..... 18

TABLE OF AUTHORITIES—*(Continued)*

OTHER AUTHORITIES: **Page**

R. Banks & A. Doupnik, *Introduction to Computer Science* (1976) 24

Letter by Henry Davis, *"Look and Feel" Isn't Everything in This Case*, BYTE, July 1986 4

BYTE, July 1986 4

Letter by James E. Bransfield, *Visual Copyrights*, BYTE, April 1986 4

Editorial: A Threat to Future Software, BYTE, Jan. 1986. 13

1986 Computer Industry Litigation Rep. 3

1985 Computer Industry Litigation Rep. 4

4 Computer L. Rep. 391 (1985) 4

Protected Expression in Software, Computer L. Strategist, April 1985 4

Broad Copyright Protection Given to Computer Programs, Computer L. Strategist, Sept. 1986 4

Third Circuit to Determine Scope of Copyright Protection, Computer L. Strategist, Dec. 1985. 4

Conley & Bryan, *A Unifying Theory of Computer Software Copyright Cases*, 63 N.C.L. Rev. 563 (1985) 3

Current Developments — Proprietary Rights — Copyright Protection Extends to "Structure, Sequence and Organization" of Computer Program, 3 Computer Law., Sept. 1986 4

Davis, *Computer Software — The Final Frontier: Clones, Compatibility and Copyright*, 2 Computer Law., June 1985, July 1985 ..... 4, 10, 20

Dun's Business Month, July 1986 4

Electronics Week, Sept. 16, 1985 4

TABLE OF AUTHORITIES—*(Continued)*

OTHER AUTHORITIES: **Page**

Elman, *A Personal View of the Whelan v. Jaslow Appellate Arguments — Fifty More Minutes on Software Copyright*, 4 Computer L. Rep. 840 (1986) 4

Gesmer, *Developments in the Law of Computer Software Copyright Infringement*, 26 Jurimetrics J. 224 (Spring 1986) 3, 15, 20

Goldstein, *Infringement of Copyright in Computer Programs*, 47 U. Pitt. L. Rev. (1986) (manuscript to be published) 10, 12

Kidwell, *Software and Semiconductors: Why Are We Confused?*, 70 Minn. L. Rev. 533 (1985) 3

D. Knuth, *The Art of Computer Programming: Fundamentals of Algorithms* (1975) 24

Kost, *Whelan v. Jaslow: Back to the Rough Ground!*, 5 Computer L. Rep. 145 (1986) 4, 10, 17

Liebman, Katsch & Leitch, *Back to Basics: A Critique of the Emerging Judicial Analysis of the Outer Limits of Computer Program "Expression"*, 2 Computer Law., Dec. 1985 ..... 4, 10

M. Nimmer, *Nimmer on Copyright* (1984) 20

Pokotilow, *Patents and Copyright — Programs Get a Lot More Protection*, 9 Pa. L.J.-Rep., Sept. 1, 1986 4

PR Newswire, Aug. 18, 1986 (LEXIS, Nexis Library, Omni file) 4

Raysman & Brown, *Copyright Infringement by Nonidentical Software*, 93 N.Y.L.J. 1 (April 9, 1985) 4

Samuelson, *CONTU Revisited: The Case Against Copyright Protection for Computer Programs in Machine-Readable Form*, 1984 Duke L.J. 663 ..... 12, 24

OTHER AUTHORITIES: **Page**

Samuelson, *Creating a New Kind of Intellectual Property: Applying the Lessons of the Chip Law to Computer Programs*, 70 Minn. L. Rev. 471 (1985) ..... *passim*

Stern, *Opinion — Is There, and Should There Be, Infringement of Copyright When Computer Programs Written in Different Codes Achieve the Same Results?*, 5 Eur. Intell. Prop. Rev. 123 (1985) 3, 11

U.S. Congress, Office of Technology Assessment, *Intellectual Property Rights in an Age of Electronics and Information* (April 1986) ..... *passim*

Zelkowitz, *Perspectives on Software Engineering*, 10 Computing Surveys 197 (June 1978)..... 26

IN THE

SUPREME COURT OF THE UNITED STATES

October Term, 1986

JASLOW DENTAL LABORATORY, INC., EDWARD JASLOW, RAND JASLOW AND DENTCOM, INC.,
Petitioners,

v.

WHELAN ASSOCIATES, INC.,
Respondent.

PETITION FOR A WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE THIRD CIRCUIT

Petitioners, Jaslow Dental Laboratory, Inc., Edward Jaslow, Rand Jaslow, and Dentcom, Inc., pray that a writ of certiorari be issued to review the judgment of the United States Court of Appeals for the Third Circuit entered on August 4, 1986.

OPINIONS BELOW

The opinion of the Court of Appeals (A1) of which review is sought is reported at 797 F.2d 1222 (3d Cir. 1986). The principal opinion of the District Court (A61) is reported at 609 F. Supp. 1307 (E.D. Pa. 1985), and the District Court's disposition of the post-trial motions (A94) is reported at 609 F. Supp. 1325 (E.D. Pa. 1985).

JURISDICTION

The judgment of the Court of Appeals (A107) was entered on August 4, 1986, and this petition is being filed within 90 days of that date. On August 29, 1986, the Court of Appeals granted a stay of the issuance of the certified judgment in lieu of a formal mandate until October 24, 1986 (A108).

The Court has jurisdiction to review the judgment of the Court of Appeals under 28 U.S.C. § 1254(1).

CONSTITUTIONAL AND STATUTORY PROVISIONS INVOLVED

This case involves the following constitutional provision and statute:

U.S. Const. art. I, § 8, cl. 8.

Section 8, Clause 8. Patents and copyrights

To promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries;

Copyright Act, 17 U.S.C. § 102(b) (1982).

§ 102 Subject matter of copyright: In general

(a) Copyright protection subsists, in accordance with this title, in original works of authorship fixed in any tangible medium of expression, now known or later developed, from which

they can be perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device. Works of authorship include the following categories:

(1) literary works;

(2) musical works, including any accompanying words;

(3) dramatic works, including any accompanying music;

(4) pantomimes and choreographic works;

(5) pictorial, graphic, and sculptural works;

(6) motion pictures and other audiovisual works; and

(7) sound recordings.

(b) In no case does copyright protection for an original work of authorship extend to any idea, procedure, process, system, method of operation, concept, principle, or discovery, regardless of the form in which it is described, explained, illustrated, or embodied in such work.

STATEMENT OF THE CASE

This petition seeks review of a widely reported decision of the United States Court of Appeals for the Third Circuit which addressed the scope of copyright protection of a computer program.[1] In this case, the Third Circuit determined as a matter of

---

1. The public focus on this case has been extraordinary. Commentators in the general media and in the computer and legal fields have recognized that the case is tremendously significant to the computer industry. Coverage by legal journals has been extensive. *See, e.g.*, Conley & Bryan, *A Unifying Theory of Computer Software Copyright Cases*, 63 N.C.L. Rev. 563, 614 (1985); Gesmer, *Developments in the Law of Computer Software Copyright Infringement*, 26 Jurimetrics J. 224, 229-32 (Spring 1986); Kidwell, *Software and Semiconductors: Why Are We Confused?*, 70 Minn. L. Rev. 533, 570 n.182 (1985); Samuelson, *Creating a New Kind of Intellectual Property: Applying the Lessons of the Chip Law to Computer Programs*, 70 Minn. L. Rev. 471, 526 n.257 (1985); Stern, *Opinion — Is There, and Should There Be, Infringement of Copyright When Computer Programs Written in Different Codes Achieve the Same Results?*, 5 Eur. Intell. Prop. Rev. 123 (1985); 1986 Computer Industry

law that the structure and other nonliteral elements of a computer program are protected by the copyright in the program.

The issues in this case come sharply into focus if one delineates at the outset the distinction between the program code and the structure of the program. The program code consists of specific statements that, when converted to electrical signals in the computer, cause it to produce a particular result. The instructions may take the form of either source code or object

---

Litigation Rep., 3,801-02, 4,489-91, 4,511-40, 4,709-10; 1985 Computer Industry Litigation Rep. 2285, 2304, 2351, 2371, 2433, 2442, 2483, 2504, 2509, 2514, 2752, 2784, 3070, 3084, 3136, 3161, 3198, 3231; *Broad Copyright Protection Given to Computer Programs*, Computer L. Strategist, Sept. 1986, at 1; *Third Circuit to Determine Scope of Copyright Protection*, Computer L. Strategist, Dec. 1985, at 1; *Protected Expression in Software*, Computer L. Strategist, April 1985, at 1; *Current Developments — Proprietary Rights — Copyright Protection Extends to "Structure, Sequence and Organization" of Computer Program*, 3 Computer Law., Sept. 1986, at 23; Davis, *Computer Software — The Final Frontier: Clones, Compatibility and Copyright*, 2 Computer Law., June 1985, at 1, 2-10, July 1985, at 11, 11-15; Kost, *Whelan v. Jaslow: Back to the Rough Ground!*, 5 Computer L. Rep. 145 (1986); Elman, *A Personal View of the Whelan v. Jaslow Appellate Arguments — Fifty More Minutes on Software Copyright*, 4 Computer L. Rep. 840 (1986); 4 Computer L. Rep. 391, 420, 447 (1985); Liebman, Katsch & Leitch, *Back to Basics: A Critique of the Emerging Judicial Analysis of the Outer Limits of Computer Program "Expression,"* 2 Computer Law., Dec. 1985, at 2-10; Pokotilow, *Patents and Copyright — Programs Get a Lot More Protection*, 9 Pa. L.J.-Rep., Sept. 1, 1986, at 3; Raysman & Brown, *Copyright Infringement by Nonidentical Software*, 93 N.Y.L.J. 1 (April 9, 1985). The Office of Technology Assessment of the United States Congress has discussed the case in a recent report. U.S. Congress, Office of Technology Assessment, *Intellectual Property Rights in an Age of Electronics and Information* 81 (April 1986) [hereinafter OTA Report]. Numerous general news and computer news publications have also emphasized the importance of the case. *See, e.g.*, BYTE, July 1986, at 32; Letter by Henry Davis, *"Look and Feel" Isn't Everything in This Case*, BYTE, July 1986, at 22; Letter by James E. Bransfield, *Visual Copyrights*, BYTE, April 1986, at 14; Dun's Business Month, July 1986, at 32; Electronics Week, Sept. 16, 1985, at 22; PR Newswire, Aug. 18, 1986 (LEXIS, Nexis library, Omni file).

code.[2] The Court of Appeals referred to the source code and object code as the "literal elements" of a program. 797 F.2d at 1234, A23.

The structure of a computer program, on the other hand, refers not to the specific statements or instructions included in the program, but to the overall sequence and organization of the program code.[3] The structure of a computer program is closely intertwined with the methods and processes implemented by the program.

This case does not involve the copyrightability of the source code or object code of computer programs,[4] nor does it involve infringement by near-identical or substantial copying of the literal elements of a program. The District Court did not find, and indeed there was no allegation, that any such copying had occurred. Lastly, although the computer programs at issue in this case were written in different computer languages, this case also does not involve infringement by translation. Here, too, there were no allegations or findings to this effect.

The legal issues raised by this case revolve principally around the scope of copyright protection in computer program structures, and whether copyright may be used to prevent others

---

2. The source code of a computer program is the form in which the programmer originally "writes" the program. The source code may be written in a high-level (*i.e.*, "English-like") language or in low-level machine-dependent assembly language, and may include statements other than processor instructions (*e.g.*, pseudo-ops in assembly language). The source code is then "translated" to object code, which is represented symbolically as a series of "0"s and "1"s and which controls the operation of the computer while the program is running.

3. The term "structure" has been used in different contexts in computer cases and has been the source of some confusion. In the context of this case, it refers to the organization and logical sequencing of the *program code itself*, and has nothing to do with the organization, sequencing, or selection of screen output, menus, user interface, etc. For this case, structure means *code structure*.

4. The copyrightability of these literal elements is well established, and not at issue. *See, e.g., Stern Elecs., Inc. v. Kaufman*, 669 F.2d 852, 855 n.3 (2d Cir. 1982) (source code); *Williams Elecs., Inc. v. Artic Int'l, Inc.*, 685 F.2d 870 (3d Cir. 1982) (object code).

from using and learning from the structures of pre-existing computer programs.

* * *

Jaslow Dental Laboratory, Inc. ("Jaslow Lab") is a Pennsylvania corporation in the business of manufacturing dental prosthetics and devices (1077a). Dentcom, Inc. ("Dentcom") is a Pennsylvania corporation engaged in the business of developing and marketing computer programs for use by dental laboratories (1088a). Edward Jaslow and Rand Jaslow are officers and shareholders of Jaslow Lab and Dentcom (1078a, 1088a). Whelan Associates, Inc. ("Whelan Associates") is also a Pennsylvania corporation, engaged in the business of developing and marketing custom computer programs (1076a).

Jaslow Lab, like any other business of moderate complexity, has significant bookkeeping and administrative tasks. In 1978, Rand Jaslow purchased an IBM Series One computer and contracted with Strohl Systems Group, Inc. ("Strohl"), a small corporation specializing in the design of custom computer programs, to create a program to automate the record-keeping tasks performed by Jaslow Lab (1078a-79a). Elaine Whelan was the programmer at Strohl in charge of the project (1078a). During the course of the project, Rand Jaslow worked very closely with Ms. Whelan, explaining to her the workings of Jaslow Lab, including the details of its operation, administration and management (36a, 53a-54a).

After this education, Ms. Whelan wrote a program called "Dentalab" for Jaslow Lab in a computer language known as EDL (Event Driven Language). The program was completed and was operated on the Series One computer at Jaslow Lab in March of 1979 (1081a).

In November, 1979, Elaine Whelan left Strohl to form Whelan Associates, Inc. to market the Dentalab program to other dental laboratories[5] (1082a-83a). Whelan Associates and

5. By virtue of a series of agreements, Whelan Associates acquired Strohl's interest in the Dentalab program (1082a-83a).

Jaslow Labs subsequently entered into an agreement on July 30, 1980, whereby Jaslow Lab agreed to act as sales agent of Whelan Associates in marketing the Dentalab program (1085a-86a). Jaslow Lab performed under this agreement for approximately two years, during which time Rand Jaslow became quite familiar with the Dentalab program.

In mid-1982, Rand Jaslow commenced preparation of a new computer program to automate the tasks of a dental laboratory (1089a-90a). This program, called the "Dentcom PC program," was written in the BASIC language for the IBM PC personal computer to fill a need for a dental laboratory program that could operate on that inexpensive and popular computer. The Dentcom PC program was completed in or about September, 1983, and, at about that time, Dentcom, Inc. was formed to market the program (1090a-91a).

Whelan Associates brought this suit against petitioners on September 21, 1983, alleging, *inter alia*, copyright infringement in connection with the distribution by Dentcom of the Dentcom PC program (CR-1). Whelan Associates alleged that it was the owner of copyright in the Dentalab program and that the Dentcom PC program infringed that copyright (CR-1). Whelan Associates asserted that the District Court had jurisdiction under 28 U.S.C. § 1338.

The action was tried to the District Court from July 9, 1984 to July 11, 1984. During the trial, Whelan Associates' expert witness conceded that there were no similarities in the literal elements of the two programs and that the Dentcom PC program was not a mere translation from EDL to BASIC of the Dentalab program (735a). The only similarities between the programs that were adduced by the plaintiff's expert were similarities in such peripheral features as file structures, screen outputs and the manner of operation of selected portions of the programs (685a-718a). Petitioners introduced expert testimony indicating that the Dentcom PC program was not copied from the Dentalab program (837a-39a).

On January 22, 1985, the District Court entered judgment in favor of Whelan Associates, concluding that it was the owner of a valid copyright in the Dentalab program, and that the copyright was infringed by the Dentcom PC program. 609 F. Supp. at 1323-24, A89. The court gave sweeping copyright protection to computer programs, holding that the copyright in a program protects the "manner in which the program operates, controls and regulates the computer . . . ." 609 F. Supp. at 1320, A83. The court entered an order restraining petitioners from, *inter alia*, selling or licensing the Dentcom PC program. 609 F. Supp. at 1325, A91.

The parties subsequently filed post-trial motions, including a motion by petitioners for a new trial or for alteration of the judgment and motions by Whelan Associates for attorney's fees and an accounting of post-trial damages. On May 9, 1985, the court entered an opinion and order granting the motion for an accounting of post-trial damages and denying the other post-trial motions. 609 F. Supp. 1325 (E.D. Pa. 1985), A94. The parties subsequently stipulated to the accounting, and the district court entered a supplemental order and final judgment on November 15, 1985.[6] A105.

On June 6, 1985, petitioners appealed from the portion of the District Court's judgment holding the copyright in the Dentalab program to be infringed by the Dentcom PC program. Oral argument on that appeal was held on March 3, 1986. The Court of Appeals issued its decision approximately five months later on August 4, 1986. In a lengthy and far-reaching opinion by Circuit Judge Edward R. Becker, the Court of Appeals addressed critical issues regarding the scope of copyright protection in computer programs and held that the structures of programs are protected by copyright.

---

6. The Court of Appeals apparently was unaware that the District Court had entered a final judgment. 797 F.2d at 1229 n.12, A14.

REASONS FOR GRANTING THE WRIT

INTRODUCTION

Even among the many important cases bidding for this Court's attention, this case stands out as an extraordinary one for the following reasons:

1. This case involves critical legal issues in the field of copyright and computer programs. It raises the vital issue of whether computer program structure — a key element of every program — is copyrightable. Until this Court speaks, the computer industry will be in turmoil. There will be no end of litigation over what aspects of a computer program are protected by copyright. Continued uncertainty, lack of reliable standards, and ultimate market confusion, which the Court of Appeals' decision will create, can only stifle the development of new software. An authoritative decision by this Court now will provide much-needed guidance to the computer software industry in this nation. It will also promote judicial economy, forestalling mushrooming and burdensome litigation over the scope of copyright protection of computer programs.

2. This case has distinct constitutional dimension involving the scope of Article I, § 8, Clause 8 of the Constitution as applied to the computer sciences.

3. In a display of judicial activism, the Court of Appeals made its own copyright law in this case and has cast aside the express prohibitions in Section 102(b) of the Copyright Act, which excludes "systems," "processes," and "methods of operation" from the scope of copyright protection. In deciding the fundamental question of what aspects and features of a computer program are encompassed by the copyright in the program, the court applied the so-called "idea/expression" dichotomy, a concept that arose out of cases involving traditional works of authorship such as novels and plays, and which has little or no meaning

when applied to computer programs. This Court should enunciate appropriate standards for deciding the application of Section 102(b) to computer programs, standards based upon the express prohibitions of Section 102(b).

4. The new "rule" created by the Court of Appeals for distinguishing "idea" from "expression" in a computer program is incapable of meaningful application and, if followed, will have a dramatic chilling effect on the development of software in this country.

5. This case raises the important issue of whether the degree of one's labor and effort in creating a work is relevant in determining the scope of copyright protection for the work.

Each of these reasons for granting the writ will be briefly amplified.

I. THIS CASE IS OF CRITICAL IMPORTANCE TO AN ENTIRE INDUSTRY AND HAS FAR-REACHING IMPLICATIONS FOR THE PUBLIC.

This case is of extraordinary importance to the nation's computer industry, a rapidly growing sector of the economy which is at the forefront of technological innovation in the world. The case has received considerable attention from a variety of trade and legal publications,[7] and the decisions of the courts below have generated a torrent of criticism from the bar.[8] The submission to

---

7. *See supra* note 1.

8. *See* Davis, *supra* note 1, at 3, 4 (characterizing the District Court's definition of expression in a computer program, with which the Court of Appeals explicitly agreed (797 F.2d at 1239, A35 to A36), as a "judicial bombshell" and "dangerously wrong"); Goldstein, *Infringement of Copyright in Computer Programs*, 1119, 1126 (1986) ("the functions that [the District Court in] *Whelan* was disposed to characterize as protectable expression are more accurately characterized as unprotectable ideas"); Kost, *supra* note 1, at 146 (stating that the Court of Appeals' analysis is "unworkable"); Liebman, Katsch & Leitch, *supra* note 1, at 2 (lamenting failure of *Whelan* decision to "recognize the utilitarian nature of computer programs"); Samuelson, *supra* note 1, at 526 n.257

the Court of Appeals of an *amicus curiae* brief by The Computer Software and Services Industry Association, Inc. ("ADAPSO"), a trade organization in the software industry, serves to underscore the importance of the issues presented here.

The computer software industry is closely following the progress of this case. There can be no question that the future development of that industry and of the numerous other industries in the United States that are becoming increasingly more dependent upon computer software will be significantly affected by the ultimate determination of these critical issues. If the structure of a computer program is determined to be protected by copyright, then serious consequences will follow:

(a) Copyright will protect "processes" and "methods of operation."

First, because it is virtually impossible to distinguish a program's structure from the processes and methods of operation carried out by the program, those methods and processes will invariably become protected by the copyright in the program. This is forbidden by Section 102(b) of the Copyright Act.

(b) Computer programs will receive patent-like protection in the guise of copyright.

Second, the Court of Appeals' decision confers patent-like protection upon the processes and systems of computer programs under the aegis of copyright, thereby circumventing the safeguards of the patent system. Copyrights are very easily and quickly obtained and provide a 75-year monopoly. Obtaining a patent, however, is a long, arduous, and expensive process, and the applicant must define with particularity the claimed invention. Moreover, the patent applicant must meet rigorous tests of

(questioning the extension of copyright protection to computer program structure); Stern, *supra* note 1, at 124 (criticizing "defective" analysis and "unsound reasoning" of *Whelan* decision); OTA Report, *supra* note 1, at 81 (stating that the test for expression in a computer program that was adopted by the District Court and the Court of Appeals is "[i]n theory [not] permitted under traditional copyright principles").

novelty and non-obviousness, which are not prerequisites of copyright protection. In addition, the patent owner is awarded a monopoly of only 17 years, a fraction of the duration of the copyright monopoly. Finally, the owner of a computer program could, through copyright, receive patent-like protection for a program structure without making full disclosure of the work to the public, the historic *quid pro quo* for the grant of the patent monopoly.[9] These were precisely this Court's concerns in *Baker v. Selden*, 101 U.S. 99 (1879).

(c) The Court of Appeals' rule will stifle innovation and deter competition in the software industry.

Third, early market entrants, increasingly the larger, better established, and more powerful companies, will have the ability to capture the technologies underlying the processes and methods of operation of their programs by copyrighting the program structures. The net effect will be to deter competition and to stifle innovation in the computer software market. Where computer software patents are concerned, a competitor may write software using similar methods and processes, provided any specific patent claims are avoided; but in copyright, mere similarity becomes the very basis for a claim of copyright infringement. This compounds the chilling effect on potential competitors. The deterrent effect of overbroad copyright protection is especially keen in the computer software industry, where progress is made not by revolutionary leaps but by evolutionary steps. Programmers build and improve on the work of their predecessors; they

---

9. *See* Samuelson, *CONTU Revisited: The Case Against Copyright Protection for Computer Programs in Machine-Readable Form*, 1984 Duke L.J. 663, 705-27, in which Professor Samuelson establishes that disclosure of protected works is a fundamental goal of both copyright and patent — a goal that is defeated by the meager deposit requirements of the Copyright Office (37 C.F.R. Ch. II, §§ 202.20-.21) and the distribution of copyrighted computer programs in object code form. Professor Goldstein has a wonderful discussion of the different goals of patent and copyright in Goldstein, *supra* note 8, at 1122-24.

are expected to learn from prior work.[10] Broad copyright protection for computer program structures will serve only to mandate continued "re-invention of the wheel."

These consequences raise compelling issues of great public concern — issues that have not been considered and decided by this Court. Yet, these legal issues are now ripe for decision, and the situation has become urgent as the lower federal courts are increasingly being called upon to apply copyright principles to computer programs. Until these issues are decided by this Court, the application of copyright law to computer programs will remain in question, continuing the present confusion and uncertainty and spawning continued litigation. What is needed is a uniform and well-reasoned standard and procedure, akin to those enunciated by this Court in *Graham v. John Deere Co.*, 383 U.S. 1 (1966), which ended a period of uncertainty in the patent law and provided an effective tool for use by the lower courts.

II. THE COURT OF APPEALS HAS ENGRAFTED A JUDICIAL AMENDMENT ON THE COPYRIGHT ACT WHICH OVERRIDES SECTION 102(b).

The Court of Appeals held that the structure and other nonliteral elements of a computer program are protected by copyright. These features of a computer program are the very "systems," "processes," and "methods of operation" excluded from copyright protection by Section 102(b).

One of the most fundamental and longstanding principles underlying the law of copyrights is that copyright protection does not extend to methods, processes, or systems. This principle is an application of what has been described as "one of the central

---

10. *See Editorial: A Threat to Future Software*, BYTE, Jan. 1986, at 6 (lamenting Apple Computer's success in forcing a competitor to withdraw from the market a new program that Apple claimed looked too much like its Macintosh user interface).

tenets of copyright law"[11] — that copyright does not protect "utilitarian works." The best application of the principle is this Court's famous decision in *Baker v. Selden*, 101 U.S. 99 (1879), now codified in Section 102(b) of the Copyright Act (17 U.S.C. § 102(b) (1982)):

> "(b) In no case does copyright protection for an original work of authorship extend to any idea, *procedure, process, system, method of operation*, concept, principle, or discovery, regardless of the form in which it is described, explained, illustrated, or embodied in such work." (Emphasis added.)

The express prohibition contained in Section 102(b) relates not only to ideas but also to any "procedure," "process," "system," or "method of operation." As this Court held in *Baker v. Selden*, such things as processes, systems, and methods of operation are not included within the scope of copyright. 101 U.S. at 104-05. By its application of copyright protection to program structure, the Court of Appeals has conferred *de facto* protection on these excluded elements of computer programs.

The reasons underlying Section 102(b) reflect the basic nature of copyrightable subject matter. Copyright relates to works that by their very nature communicate to human beings, either directly in language-oriented works such as books, movies, and recorded statements, or indirectly in artistic works such as sculptures, paintings, and music.[12] A brief look at the seven categories of "works of authorship" set forth in Section 102(a) makes this apparent.

---

11. *See* Samuelson, *Creating A New Kind of Intellectual Property: Applying The Lessons of the Chip Law to Computer Programs*, 70 Minn. L. Rev. 471, 473 & n.7 (1985).

12. *See* Samuelson, *supra* note 11, at 484 (purpose of traditional copyrighted works is "portraying an appearance or conveying information"). *See* definition of "useful article" in §101 of the Copyright Act (17 U.S.C. §101 (1982)). *See also* definition of "copies" in §101 of the Copyright Act (17 U.S.C. §101) as "material objects . . . from which the work can be perceived . . . or otherwise communicated. . . ."

These items are the stuff of human communication. Any system of protecting a work of authorship, therefore, since it basically makes a form of communication unlawful, runs the risk of stifling the free and open discussion of concepts and dissemination of ideas. For traditional works of authorship, the courts have struggled for years with this risk under the rubric of the so-called "idea/expression dichotomy." What the courts have found is that it is easy to state that the "ideas" contained in a work are not protected but far more difficult to enunciate any clear test for distinguishing the "idea" from the "expression."[13]

As difficult as this may be for traditional works, and as great as the risks may be, computer programs add a whole new dimension to the problem. The new dimension is the added danger of stifling technological development of new computer software. This is so because, unlike traditional works, computer programs *do something* — they cause a "process" or "method of operation" to take place inside the computer. And if Section 102(b) means anything at all, it means that a property right in this "process" will not be conferred upon the first person who pays a $10 fee and obtains a certificate from the Copyright Office.

Copyright has always protected works whose primary purpose is communicative. Computer programs, however, are not communicative, but functional in nature.[14] This difference be-

13. Judge Learned Hand, in an attempt to provide a guideline, formulated the famous "abstractions test":

> "Upon any work, and especially upon a play, a great number of patterns of increasing generality will fit equally well, as more and more of the incident is left out. The last may perhaps be no more than the most general statement of what the play is about, and at times might consist only of its title; but there is a point in this series of abstractions where they are no longer protected, since otherwise the playwright could prevent the use of his 'ideas,' to which, apart from their expression, his property is never extended."

Nichols v. Universal Pictures, 45 F.2d 119, 121 (2d Cir. 1930), *cert. denied*, 282 U.S. 902 (1931) (Citations omitted). Thirty years later, Judge Hand acknowledged, however, that "[d]ecisions must . . . inevitably be *ad hoc*." *Peter Pan Fabrics, Inc. v. Martin Weiner Corp.*, 274 F.2d 487, 489 (2d Cir. 1960).

14. *See* Gesmer, *Developments in the Law of Computer Software Copyright Infringement*, 26 Jurimetrics J. 224, 225 (Spring 1986), where the author

tween traditional works and computer programs can best be demonstrated by reference to the concept of efficiency. Efficiency in programming is often determined by reference to speed of execution, size of compiled code, and other manifestations of how well the program operates. With computer programs, there is often a best way — a most efficient way — to organize the program to produce the desired result. This concept, however, is entirely foreign to traditional works. There is no "most efficient" way to tell a story or write a symphony. These traditional works deal solely with human communication and have no effect whatsoever upon how well a physical machine operates.

Efficiency is arguably the very essence of technological development. Greater efficiency tends to produce the greatest amount of output with the least amount of input in the shortest period of time. And computers have made vast contributions to the development of technology in the last two decades.

What does this all mean to Section 102(b)? It means that, since the structure of a computer program determines to a great extent the efficiency of the program, protecting structure confers a property right in efficiency. If the copyright law may be employed to allow the first person who uses that structure to own it, and thereby prevent others from using it, the inevitable result will be the stifling of technological development, the concentration of enormously valuable intellectual property rights in the hands of a few, and the reduction of competition in software. It is beyond argument that the copyright laws were never intended to allow such a result.

---

states:

> "The extension of copyright protection to computer software requires the courts to apply copyright principles to a type of literary work which is different in certain ways from any other protected by the copyright laws. The most fundamental of these differences is that computer programs lack the communicative function of traditional literary works."

In the instant case, the Court of Appeals went to great lengths to distinguish the "idea" contained in the respondent's computer program from the "expression" of that idea. What resulted from the process was a long scholarly opinion that dealt largely with abstractions that have little applicability to the real world of computer software.[15] The court did not attempt to identify the "procedure," "process," "system," or "method of operation" which is embodied in the program and which is specifically denied protection by the express words of Section 102(b). By conducting a metaphysical hunt for the abstract "idea" buried in the program, the court ignored the very words in Section 102(b) that were specifically intended by Congress to apply to computer programs — procedure, process, system, method of operation. Indeed, Section 102(b) includes the term "idea" as the first of a list of nonprotected elements of copyrighted works, and the court's analysis simply fails to address the others. The mere fact that structure may not, in the court's view, be "idea" does not necessarily mean that it is protected. It may indeed not be "idea" but still be a "process," "system" or "method of operation."

Up to now, in evaluating the scope of copyright for computer programs, the courts have done exactly what the Court of Appeals did in the instant case. They have attempted to apply the idea/expression dichotomy, which was designed for communicative works, to computer programs, which were never intended to communicate. Since a traditional work is communicative in nature, it "expresses" an idea or concept to its human audience. It is said to have "expression." But computer programs are not created to "express" anything to anyone and to attempt to find the "expression" in them is a frustrating and ultimately empty exercise.

A computer program, despite the fact that it has been classified by the courts as a "literary work" under Section 102(a) of the Copyright Act, is very different from an expressive literary

15. A commentator has recently observed that in the Third Circuit's opinion in this case "we see copyright rapidly becoming the captive of its own abstractions." Kost, *supra* note 1, at 146.

work, such as a novel, play, or poem. The prohibitions contained in Section 102(b) have a very special importance with respect to programs. The legislative history of Section 102(b) makes clear that the primary focus of this section was computer programs. *See* H.R. Rep. No. 1476, 94th Cong., 2d Sess. 56-57, *reprinted in* 1976 U.S. Code Cong. & Ad. News 5659, 5670. Nearly half the discussion in the legislative history was of computer programs and Congress' concern that systems, processes, and methods of operation would be included in the copyright in the program:

> "Some concern has been expressed *lest copyright in computer programs should extend protection to the methodology or processes adopted by the programmer*, rather than merely to the "writing" expressing his ideas. Section 102(b) is intended, among other things, to make clear that the expression adopted by the programmer is the copyrightable element in a computer program, *and that the actual processes or methods embodied in the program are not within the scope of the copyright law*." *Id*. (Emphasis added.)

The structure of a computer program is so closely intertwined with its logic, processes, and methods of operation that to protect the structure of a computer program is to protect the programmer's logic and methodology,[16] the very processes that Section 102(b) excludes from copyright. By focusing upon the "idea" of the program and attempting to apply traditional copyright concepts to a work that does not fit them, the Court of Appeals ignored the express prohibitions of Section 102(b).

In its opinion, the Third Circuit deliberately refused to recognize any meaningful distinction between traditional literary works and computer programs. For example, after citing a string of cases dealing with virtually every other kind of copyrighted work, the Court of Appeals, in a statement that is symptomatic of its entire opinion, said emphatically:

---

16. *See* OTA Report, *supra* note 1, at 81.

> "Computer programs are no different." 797 F.2d at 1246, A52.

Earlier, the court said:

> "We are not convinced that progress in computer technology or technique is qualitatively different from progress in other areas of science or the arts." 797 F.2d at 1238, A34.

But there is a vast difference between computer programs and traditional copyrighted works. That distinction must be recognized and addressed for purposes of copyright protection. The copyright law itself has long recognized that there are significant differences even among the traditional literary works. And those differences have been accommodated by variations in the degree of copyright protection accorded to the different types of works. *See Landsberg v. Scrabble Crossword Game Players, Inc.*, 736 F.2d 485, 488 (9th Cir.), *cert. denied*, ____U.S. ____, 105 S. Ct. 513 (1984) ("degree of substantial similarity required to show infringement varies according to the type of work and the ideas expressed in it"); *Atari, Inc. v. North American Philips Consumer Elecs. Corp.*, 672 F.2d 607, 616-17 (7th Cir.), *cert. denied*, 459 U.S. 880 (1982) ("that a work is copyrighted says very little about the scope of its protection").

At one end of the spectrum of protection, highly expressive and fanciful works, such as novels and poems, have received the highest degree of protection, including protection for their nonliteral elements. *See, e.g., Twentieth Century-Fox Film Corp. v. MCA, Inc.*, 715 F.2d 1327, 1329 (9th Cir. 1983) (motion pictures). At the other end of the protection spectrum, works such as business and legal forms, recipes, and contest rules, have received only the narrowest form of protection, often to the point of requiring literal duplication for infringement. *See, e.g., Landsberg*, 736 F.2d at 488 (description of game strategy); *Continental Casualty Co. v. Beardsley*, 253 F.2d 702, 706 (2d Cir.), *cert. denied*, 358 U.S. 816 (1958) (business forms); *Kepner-Tregoe, Inc. v. Carabio*, 203 U.S.P.Q 124, 131 (E.D. Mich. 1979) (societal interest is in giving only narrow protection

to works that teach or explain the useful arts so that many may offer the art in the marketplace); 3 M. Nimmer, *Nimmer On Copyright* §13.03[A] at 13-39 (1984) ("[w]ith respect to commercial documents . . . the similarity probably must be more extensive than in the case of more artistic works in order to justify [infringement]"). Computer programs are pure utilitarian works. Application of longstanding copyright principles to computer programs produces only the narrowest form of protection for them — protection for only their literal code.

The distinctive, purely functional nature of computer programs requires that this Court enunciate a proper approach for determining the scope of copyright protection in computer programs — an approach that bypasses entirely the idea/expression dichotomy and focuses on the specific statutory provision that Congress enacted for this purpose — Section 102(b). Indeed, a leading commentator in this area has stated flatly that "[n]ew tests and modified legal principles will have to be developed to deal with computers — a form of 'literary machines.' " Davis, *supra* note 1, at 3. At the very least, this Court should intervene to reaffirm the longstanding copyright principles that confer only narrow protection for commercial works. In either case, this Court must provide guidance to the federal judiciary and to the computer industry based on an explicit recognition that computer programs are generically different from traditional works of authorship.

The federal courts are increasingly being called upon to apply the law of copyright, which itself is highly specialized and sometimes difficult to discern, to an area of technology about which they have little understanding.[17] The result has been a growing number of decisions that can only be characterized as misguided attempts to apply traditional copyright rules arising

17. The District Judge in the instant case frankly acknowledged that he had "practically no knowledge of the operation of computers and computer software systems." 609 F. Supp. at 1321, A85. *See* Gesmer, *supra* note 1, at 226-27 (comparing source codes of two programs "is roughly analogous to making a judge or jury with no musical training . . . base a finding of infringement of a symphony on a comparison of the scores of the two works").

from cases involving plays, novels, movies, and poems to complex computer technology.[18] The law is heading inexorably toward broader and broader copyright protection of programs — starting with the code itself, and expanding outward to the structure of the code, to screen outputs, file structures, the "look and feel" of the program, and ultimately to the algorithms used by the programmer. It is imperative that the Court intervene now to examine the far-reaching and critical issues facing us in this area and to enforce the Congressional intent that the technology embodied in computer programs not be parcelled out to copyright owners.

III. THE IDEA/EXPRESSION TEST DEVISED BY THE COURT OF APPEALS FOR COMPUTER PROGRAMS IS MEANINGLESS AND UNWORKABLE.

Even if the idea/expression dichotomy is deemed to be the proper approach to this issue, the Court of Appeals' opinion fails to provide any meaningful guidance to the judiciary or to the computer software industry in distinguishing between the two in a computer program. Indeed, as indicated above, the decision demonstrates the ineffectiveness of the dichotomy as applied to computer software.

Copyright, like the attorney-client privilege, protects the communication, the "expression," rather than the facts or "ideas" communicated. Thus, a copyrighted description of a new automobile gives the author no rights in the thing described. Likewise, a copyrighted description of a chemical process or method of constructing a bridge gives the author no rights in the process or the method.

The line between the ideas, methods, systems, or processes that are described, explained, illustrated, or embodied in a work,

18. *See, e.g., Williams v. Arndt*, 626 F. Supp. 571 (D. Mass. 1985); *Broderbund Software, Inc. v. Pixellite Software*, No. C-85-3457, slip op. (N.D. Cal. Oct. 8, 1986). *See also* OTA Report, *supra* note 1, at 81 ("[i]n theory, none of these rulings is permitted under traditional copyright principles.").

and their expression in that work, is, as the Court of Appeals itself recognized, not a simple one to draw. The judiciary has long struggled with this question for traditional copyrightable works like books and plays.

In the arena of computer software, however, the demarcation between the processes or methods embodied in the program and any "expression" that the program may be deemed to have is especially difficult to identify. A computer program, unlike traditional forms of copyrightable works, is utilitarian in nature;[19] it causes a computer to manipulate electrical signals in a specifically structured way. Accordingly, the nonliteral elements of a computer program, such as its structure, sequence, and organization, embody the very processes and methods performed by the computer under control of the program. This close relationship between the structure of the program and the methods and processes that it implements presents an idea/expression dichotomy problem that is unique to computer programs. The question is not whether there is another possible structure that could be used in a program with the same purpose. The question is whether including the program's structure as part of the copyright necessarily includes the program's "systems, processes, and methods of operation" — all items within the specific proscription of Section 102(b).

Undaunted by this formidable task, the Court of Appeals undertook to formulate a "rule distinguishing idea from expression in computer programs." 797 F.2d at 1235, A27. The court stated:

> "the line between idea and expression may be drawn with reference to the end sought to be achieved by the work in question. In other words, *the purpose or function of a utilitarian work would be the work's idea, and everything that is not necessary to that purpose or function would be part of the expression of the idea*. Where there are various means of achieving the desired purpose, then the particular means chosen is not

19. *See* Samuelson, *supra* note 1, at 508-10.

> necessary to the purpose; hence, there is expression, not idea." 797 F.2d at 1236, A29 (Emphasis in original). (Citation and footnote omitted).[20]

The court's "rule" is a simple means-end analysis: if there are "various means" of achieving the "purpose" of the computer program, then, according to the court, those "means" constitute protectible expression. The test fails to recognize that the "means" used by a program almost always include unprotectible methods and processes. The test entirely sidesteps the issue. Indeed, the opinion is notable for its studied avoidance of the terms used in Section 102(b), "methods" and "processes," to refer to the way that a program performs its tasks.

Moreover, the court's focus on whether the means chosen is "necessary" to achieve the purpose of the program is in sharp conflict with the *Baker* doctrine and its codification in Section 102(b). Under the court's rule, non-necessary means utilized by computer programs to perform tasks are protected. Section 102(b), however, makes no distinction between necessary and non-necessary processes or methods; its prohibition of copyright protection applies to all methods and processes. This reflects the strong policy of the law that copyright is not to be used to monopolize any methods or processes, regardless of the availability of alternatives.

A brief example will illustrate the infirmity of the court's test. "Algorithm" is a term used in computer science to refer to a finite set of logical steps that constitutes a method of perform-

---

20. To further confuse matters, the Court of Appeals also explicitly adopted the District Court's sweeping definition of the expression in a computer program: "the 'expression of the idea' in a software computer program is the *manner in which the program operates*, controls and regulates the computer . . . ." 797 F.2d at 1239, A35 to A36 (Emphasis added). But that definition flies in the face of Section 102(b)'s explicit prohibition of copyright protection for "methods of operation." And neither the District Court nor the Court of Appeals articulated a distinction between a program's "manner" of operation, for which they conferred protection, and its "method" of operation, for which protection is barred. The simple point is that there is no difference.

ing a processing task.[21] There are numerous well-known, established algorithms for performing certain common tasks that arise again and again.[22] Different programmers may use the same algorithm in a wide variety of computer programs, each program having a different "end." Indeed, certain particularly well-known algorithms are routinely taught to computer science students. Algorithms embody the methods and processes used by a computer program and represent the essence of what Congress intended to exclude from copyright in Section 102(b).[23] Yet, under the "rule" announced by the Court of Appeals, algorithms would be protected by copyright so long as another algorithm is available to perform the task.[24] Thus, if a programmer employed by a bank were to use a binary search algorithm in a program to locate delinquent checks from a data file, the copyright in the program could prevent the rest of the world from using a standard binary search algorithm. Surely the drafters of the Copyright Act could not have intended such a pernicious result.

The court's "rule," moreover, defines the elusive "idea" in the program in such a grand, all-encompassing fashion that virtually every feature of every program in existence could be protected as "expression." By defining the "idea" as the "purpose or

---

21. *See* R. Banks & A. Doupnik, *Introduction to Computer Science* ch. 3 (1976); Samuelson, *supra* note 9, at 685 n.77 (description of algorithms).

22. Many such algorithms are described in D. Knuth, *The Art of Computer Programming: Fundamentals of Algorithms* (1975).

23. *See* Register of Copyrights 2d Supp. Rep. at 2 (no protection for the "programmer's algorithms"). *See also* Samuelson, *supra* note 1, at 518 n.225 (algorithms probably not protected by copyright). In *Gottschalk v. Benson*, 409 U.S. 63 (1972), the Court refused to allow a patent on an algorithm to convert binary coded decimal (BCD) data to binary data.

24. In a computer software case now pending in the Fifth Circuit, the appellant argued in its brief that once a programmer has used an algorithm in a particular application, then all programmers should be precluded by copyright from using that algorithm in future computer programs directed to that application. *See* Brief of Appellant at 19, *Plains Cotton Cooperative Ass'n of Lubbock, Texas v. Goodpasture Computer Service, Inc.*, (5th Cir.) (No. 86-1126). That such a proposition could be seriously advanced to a federal court of appeals demonstrates the imminent danger of overbroad copyright protection of computer programs.

function" of the program and then defining the purpose or function at the highest possible level of abstraction ("running a dental laboratory in an efficient way") (797 F.2d at 1238 n.34, A34 to A35), the court all but writes "idea" out of the equation. By this rule, one is free to write another program "to run a dental laboratory in an efficient way" because that is the "idea." But every other aspect of the program, including its code, structure, organization, methods, processes, systems, and look and feel will be protected. This will surely stifle the "Progress of Science" that the copyright system was intended to promote.

The Court of Appeals has failed to provide any meaningful guidelines to identify what the copyright in a computer program protects and what it does not protect. The court's "rule," as amplified later in the opinion in footnote 34, amounts to a non-test. It fails to account for and identify the unprotected methods and processes within a program. For this reason, the court's test cannot guide the courts or the computer software industry.

The application of the idea/expression dichotomy to computer programs requires a clear, guiding standard. This issue alone deserves this Court's attention. The necessary guidance by this Court now will obviate the time-consuming, costly and error-producing litigation that is taking place in the absence of a clear standard.

IV. THIS COURT SHOULD CLARIFY THE RELEVANCE OF THE DEGREE OF LABOR AND EFFORT IN CREATING A WORK TO THE SCOPE OF PROTECTION OF THE WORK.

The Court of Appeals' opinion raises the question of what role, if any, the degree of labor and effort expended in the creation of a work should play in the determination of the scope of copyright protection of the work. The amount of labor and effort required to create the structure of a computer program was a significant factor on which the Court of Appeals relied in conferring copyright protection on program structure. 797 F.2d at 1231, 1237, A19, 31. The court specifically noted:

> "among the more significant costs in computer programming are those attributable to developing the structure and logic of the program." 797 F.2d at 1237, A31.[25]

The court's preoccupation with the degree of effort required to create the structure of a computer program sharply contrasted with its inattention to the uncopyrightable methods and processes contained in a program, and resulted in a decision that confers *de facto* copyright protection on those methods and processes.

The relevance of the degree of labor expended in creating a work to the determination of copyrightability and scope of copyright protection remains an unsettled question in the federal judiciary. Most courts have held that the amount of labor expended is largely irrelevant. *See, e.g., Eckes v. Card Prices Update*, 736 F.2d 859, 862 (2d Cir. 1984); *Miller v. Universal City Studios*,

---

25. The court observed that "the coding process is a comparatively small part of programming" and cited two authorities for the proposition that "only 20%" of the cost of developing a program "goes into coding." 797 F.2d at 1231, A19. The intended inference is that if coding is "only 20%" of the cost, then structure must represent a large part of the remaining 80%, and if the court failed to protect structure, it would be leaving unprotected a major portion of the economic value of the program. First, the factual premise is wrong. The very authority relied on by the court, first cited in a footnote in an *amicus curiae* brief below (Brief of Amicus Curiae, ADAPSO, at 10 n.*) indicates clearly that "design" of the program, which is presumably its structure, represents only about 15% of its cost. Moreover, elements such as debugging, integration testing, and module testing, which are part of the coding process, together with coding, represent about 65% of program costs. *See* Zelkowitz, *Perspectives on Software Engineering*, 10 Computing Surveys 197, 198-201 (June 1978). Thus, restricting copyright to literal code will protect the part of the program that represents the great majority of its costs. Second, with respect to the relatively small economic value of computer program structure, the intellectual property laws of this country have never undertaken to cover all the fruits of one's intellectual endeavors, no matter how much creativity or hard work is involved. Neither patent nor copyright has ever extended legal monopolies to new discoveries of the laws of nature, or new mathematical processes, or indeed to new inventions or discoveries that fail to meet the requirements of novelty and non-obviousness. *See* Samuelson, *supra* note 1, at 490-92.

Inc., 650 F.2d 1365, 1369 (5th Cir. 1981). Other courts, however, have considered the amount of labor expended by the creator of a work in their determination of copyright protection. *See, e.g., West Publishing Co. v. Mead Data Central, Inc.*, 799 F.2d 1219 (8th Cir. 1986); *Schroeder v. William Morrow & Co.*, 566 F.2d 3, 5-6 (7th Cir. 1977);[26] *Leon v. Pacific Tel. & Tel. Co.*, 91 F.2d 484, 485-86 (9th Cir. 1937).

Although the relevance of the degree of labor expended in creating a work has arisen most often in the context of copyright protection for factual works and compilations of data, the issue also arises with respect to computer programs, which contain uncopyrightable methods and processes. With the advent of the information age, the task of gathering and compiling information will become even more vital. The issue of copyright protection for these efforts will arise again and again. It is surely time for this Court to clarify the role played by effort and labor in copyright protection for these kinds of works.

---

26. In a subsequent decision, the Seventh Circuit stated that "[t]he copyright laws protect the work, not the amount of effort expended." *Rockford Map Publishers, Inc. v. Directory Service Co. of Colorado, Inc.*, 768 F.2d 145, 148 (7th Cir. 1985), *cert. denied*, _____U.S. _____, 106 S. Ct. 806 (1986). *Rockford*, however, did not overrule *Schroeder*.

CONCLUSION

For each and all of the foregoing reasons, a writ of certiorari should be granted.

Respectfully submitted,

James D. Crawford*
Robert S. Bramson
Michael J. Mangan
Ronald E. Karam
Attorneys for Petitioners,
Jaslow Dental Laboratory, Inc.,
Edward Jaslow, Rand Jaslow
and Dentcom, Inc.

SCHNADER, HARRISON, SEGAL & LEWIS
Suite 3600, 1600 Market Street
Philadelphia, Pennsylvania 19103

Of Counsel.

Dated: October 23, 1986

* Attorney of Record

APPENDIX

UNITED STATES COURT OF APPEALS
FOR THE THIRD CIRCUIT

NO. 85-1358

WHELAN ASSOCIATES, INC.

v.

JASLOW DENTAL LABORATORY, INC., DENTCOM, INC., EDWARD JASLOW, RAND JASLOW, and JOSEPH M. CERRA

Jaslow Dental Laboratory, Inc., Edward Jaslow, Rand Jaslow, and Dentcom, Inc.,
Appellants

On Appeal from the United States District Court for the Eastern District of Pennsylvania

(D.C. Civ. No. 83-4583)

Argued March 3, 1986
Before: GIBBONS, BECKER, and ROSENN,
Circuit Judges

(Filed August 4, 1986)

JOEL S. GOLDHAMMER (Argued)
Seidel, Gonda, Goldhammer & Abbott
1800 Two Penn Center Plaza
Philadelphia, PA 19102

IRWIN S. RUBIN
Rubin, Glickman & Steinberg
17 Washington Avenue
Souderton, PA 18964
Attorneys for Appellee
Whelan Associates, Inc.

MICHAEL J. MANGAN (Argued)
ROBERT S. BRAMSON
RONALD E. KARAM
Schnader, Harrison, Segal & Lewis
1600 Market Street, Suite 3600
Philadelphia, PA 19103
Attorney for Appellants
Jaslow Dental Laboratory, Inc.
and Dentcom, Inc.

RONALD J. PALENSKI
MORTON DAVID GOLDBERG
RICHARD DANNAY
JO RECHT
ADAPSO Office of the General Counsel
1300 N. 17th Street, Suite 300d
Arlington, VA 22209

Attorneys for Amicus Curiae
ADAPSO, The Computer Software and
Services Industry Association, Inc.

TABLE OF CONTENTS

		Page
I.	FACTUAL BACKGROUND	4
II.	PROCEDURAL HISTORY	9
III.	TECHNOLOGICAL BACKGROUND	14
IV.	LEGAL BACKGROUND	19
	A. The elements of a copyright infringement action	19
	B. The appropriate test for substantial similarity in computer program cases	21
	C. The arguments on appeal	23
V.	THE SCOPE OF COPYRIGHT PROTECTION OF COMPUTER PROGRAMS	24
	A. Section 102(b) and the dichotomy between idea and expression	26
	1. A rule for distinguishing idea from expression in computer programs	27
	2. Application of the general rule to this case	34
	B. The CONTU Report	40
VI.	EVIDENCE OF SUBSTANTIAL SIMILARITY	43
	A. File structures	44
	B. Screen outputs	47
	C. The five subroutines	50
	D. Sufficiency of the evidence	52
VII.	CONCLUSION	58
	APPENDIX A	59

OPINION OF THE COURT

BECKER, *Circuit Judge*.

This appeal involves a computer program for the operation of a dental laboratory, and calls upon us to apply the principles underlying our venerable copyright laws to the relatively new field of computer technology to determine the scope of copyright protection of a computer program. More particularly, in this case of first impression in the courts of appeals, we must determine whether the structure (or sequence and organization)[1] of a computer program is protectible by copyright, or whether the protection of the copyright law extends only as far as the literal computer code. The district court found that the copyright law covered these non-literal elements of the program, and we agree. This conclusion in turn requires us to consider whether there was sufficient evidence of substantial similarity between the structures of the two programs at issue in this case to uphold the district court's finding of copyright infringement. Because we find that there was enough evidence, we affirm.

I. *FACTUAL BACKGROUND*

Appellant Jaslow Dental Laboratory, Inc. ("Jaslow Lab") is a Pennsylvania corporation in the business of manufacturing dental prosthetics and devices. Appellant Dentcom, Inc. ("Dentcom") is a Pennsylvania corporation in the business of developing and

1. We use the terms "structure," "sequence," and "organization" interchangeably when referring to computer programs, and we intend them to be synonymous in this opinion.

marketing computer programs for use by dental laboratories. Dentcom was formed out of the events that gave rise to this suit, and its history will be recounted below. Individual appellants Edward Jaslow and his son Rand Jaslow are officers and shareholders in both Jaslow Lab and Dentcom. Appellants were defendants in the district court. Plaintiff-appellee Whelan Associates, Inc. ("Whelan Associates") is also a Pennsylvania corporation, engaged in the business of developing and marketing custom computer programs.

Jaslow Lab, like any other small- or medium-sized business of moderate complexity, has significant bookkeeping and administrative tasks. Each order for equipment must be registered and processed; inventory must be maintained; customer lists must be continually updated; invoicing, billing, and accounts receivable, must be dealt with. While many of these functions are common to all businesses, the nature of the dental prosthetics business apparently requires some variations on the basic theme.

Although Rand Jaslow had not had extensive experience with computers, he believed that the business operations of Jaslow Lab could be made more efficient if they were computerized. In early 1978, he therefore bought a small personal computer and tried to teach himself how to program it so that it would be of use to Jaslow Lab. Although he wrote a program for the computer, he was ultimately not successful, limited by both his lack of expertise and the relatively small capacity of his particular computer.

A few months later, stymied by his own lack of success but still confident that Jaslow Lab would profit from computerization, Rand Jaslow hired the Strohl Systems Group, Inc. ("Strohl"), a small corporation that developed custom-made software to develop a program that would run on Jaslow Lab's new IBM

Series One computer and take care of the lab's business needs. Jaslow Lab and Strohl entered into an agreement providing that Strohl would design a system for Jaslow Lab's needs and that after Strohl had installed the system Strohl could market it to other dental laboratories. Jaslow Lab would receive a 10% royalty on all such sales.[2] The person at Strohl responsible for the Jaslow Labs account was Elaine Whelan, an experienced programmer who was an officer and half-owner of Strohl.

Ms. Whelan's first step was to visit Jaslow Lab and interview Rand Jaslow and others to learn how the laboratory worked and what its needs were. She also visited other dental laboratories and interviewed people there, so that she would better understand the layout, workflow, and administration of dental laboratories generally. After this education into the ways of dental laboratories -- and Jaslow Lab, in

---

2. A letter of August 31, 1978, explained what the program would do for Jaslow Lab and how much it would cost. *See* App. at 1770-75. A letter from Strohl to Jaslow Lab dated September 20, 1978, supplemented the August 31 proposal as follows:

> This communication is a supplement to our proposal letter dated 8/31/78.
>
> We [Strohl] propose that all software developed by us for your dental laboratory system remain under our ownership. This basic system can then be marketed to similar laboratories by our organization. A royalty of ten percent of the basic package price would be returned to Jaslow Dental Laboratory for each system sold.

Whelan Associates v. Jaslow Dental Laboratory, 609 F. Supp. 1307, 1310 (E.D. Pa. 1985) (the district court inadvertently identified the letter as dated September 30, 1978). Although no representative of Jaslow Lab ever signed either agreement, the district court found that Jaslow Lab had, through its conduct, accepted the terms of the letter. *Id.* at 1310.

particular -- Ms. Whelan wrote a program called Dentalab for Jaslow Lab. Dentalab was written in a computer language known as EDL (Event Driven Language), so that it would work with IBM Series One machines. The program was completed and was operative at Jaslow Lab around March 1979.

Presumably with an eye towards exploiting the economic potential of the Dentalab program, Ms. Whelan left Strohl in November, 1979, to form her own business, Whelan Associates, Inc., which acquired Strohl's interest in the Dentalab program. Shortly thereafter, Whelan Associates entered into negotiations with Jaslow Lab for Jaslow Lab to be Whelan Associates' sales representative for the Dentalab program. Whelan Associates and Jaslow Lab entered into an agreement on July 30, 1980, according to which Jaslow Lab agreed to use its "best efforts and to act diligently in the marketing of the Dentalab package," and Whelan Associates agreed to "use its best efforts and to act diligently to improve and augment the previously successfully designed Dentalab package." App. at 1779. The agreement stated that Jaslow Lab would receive 35% of the gross price of any programs sold and 5% of the price of any modifications to the programs. The agreement was for one year and was then terminable by either party on thirty days' notice.

The parties' business relationship worked successfully for two years.[3] During this time, as Rand Jaslow became more familiar with computer programming, he realized that because Dentalab was

---

3. Rand Jaslow on behalf of Jaslow Lab sent a letter to Whelan Associates on June 22, 1982, stating its intention to terminate business relations in 30 days. However, the parties continued to do business under the agreement of July 30, 1980 until the termination letter of May 31, 1983, discussed below.

written in EDL it could not be used on computers that many of the smaller dental prosthetics firms were using, for which EDL had not been implemented. Sensing that there might be a market for a program that served essentially the same function as Dentalab but that could be used more widely, Rand Jaslow began in May or June of 1982 to develop in his spare time a program in the BASIC language for such computers. That program, when completed, became the alleged copyright infringer in this suit; it was called the Dentcom PC program ("Dentcom program").[4]

It appears that Rand Jaslow was sanguine about the prospects of his program for smaller computers. After approximately a year of work, on May 31, 1983, his attorney sent a letter to Whelan Associates giving one month notice of termination of the agreement between Whelan Associates and Jaslow Lab.[5] The letter stated that Jaslow Lab considered itself to be the exclusive marketer of the Dentalab program which, the letter stated, "contains valuable trade secrets of Jaslow Dental Laboratory." The letter concluded with a thinly veiled threat to Whelan Associates: "I . . . look for your immediate response confirming that you will respect the rights of Jaslow and not use or disclose to others the trade secrets of Jaslow." App. at 1221.

---

4. The record indicates that Whelan Associates also developed a BASIC version of the Dentalab, written specially for the IBM-Datamaster 26 computer. That program [the "Datamaster" program], did not succeed commercially. Whelan Associates has also written a second program in BASIC for dental laboratories' business operations. The second program was intended for use on IBM-PC's. Neither the Datamaster program nor Whelan Associates' program for the IBM-PC is directly in issue here. *But see infra* 12 (use of Datamaster program by defendants' expert witness at trial).

5. The district court inadvertently referred to this as the letter of January 31, 1983. *See Whelan Associates v. Jaslow Dental Laboratory*, 609 F. Supp. 1307, 1313 (E.D. Pa. 1985).

Approximately two months later, on about August 1, Edward and Rand Jaslow, Paul Mohr, and Joseph Cerra formed defendant-appellant Dentcom to sell the Dentcom program.[6] At about the same time, Rand Jaslow and Jaslow Lab employed a professional computer programmer, Jonathan Novak, to complete the Dentcom program. The program was soon finished, and Dentcom proceeded to sell it to dental prosthetics companies that had personal computers. Dentcom sold both the Dentalab and Dentcom programs, and advertised the Dentcom program as "a new version of the Dentlab computer system." App. at 178; 1766-69; 1567-73.

Despite Jaslow Lab's May 31 letter warning Whelan Associates not to sell the Dentalab program, Whelan Associates continued to market Dentalab. This precipitated the present litigation.

II. *PROCEDURAL HISTORY*

On June 30, 1983, Jaslow Lab filed suit in the Court of Common Pleas of Montgomery County (Pennsylvania), alleging that Whelan Associates had misappropriated its trade secrets. Whelan Associates responded by filing the instant suit in the United States District Court for the Eastern District of Pennsylvania on September 21, 1983. As set forth in

---

6. Joseph Cerra had, from January until June, 1983, been in the employ of Whelan Associates in charge of their marketing. In this position, he had had close contact with Rand Jaslow. When he left Whelan Associates, he made a verbal promise to Elaine Whelan that he would not become associated in any business ventures with Rand Jaslow. There was, however, no written agreement. App. at 1088. Although Mr. Cerra was originally named as a defendant, he settled prior to trial.

   The record contains no information about Paul Mohr's employment history or of his previous associations with Whelan Associates or any of the defendants.

its amended complaint, Whelan Associates alleged that Dentcom's licensing of the Dentalab and Dentcom programs infringed Whelan Associates' copyright in Dentalab, App. at 452-53; that Dentcom's use of the terms "Dentlab" or "Dentalab," violated Pennsylvania common law and 15 U.S.C. § 1125(a) (Lanham Trademark Act of 1946) (false designation of origin), App. at 454-57; and that Dentcom's activities violated various other federal and state laws pertaining to unfair competition and tortious interference with contractual relations, App. at 457-63. Whelan Associates sought injunctive relief, as well as compensatory and punitive damages. App. at 464-69.

Jaslow Lab and its co-defendants answered, denying all liability. They claimed that Whelan Associates' copyright was invalid for two reasons. First, they said that although he had not been listed in the copyright registration, Rand Jaslow had been a co-author (with Elaine Whelan) of the Dentalab program. The omission of Rand Jaslow from the registration form, defendants averred, rendered the copyright defective. App. at 506-09. Second, the defendants maintained that even if Rand Jaslow had not co-authored the program, he owned the copyright because the program had been written by someone employed by him. App. at 507. Defendants also averred that Rand Jaslow had developed the Dentcom system independently, and therefore could not have violated Whelan Associate's copyright, even if the copyright were valid.[7] Finally, defendants claimed that their use

---

7. 17 U.S.C. § 106 (1982), which prescribes copyright holders' exclusive rights, forbids the copying of copyrighted works. The independent creation of even identical works is therefore not a copyright infringement, and independent creation is a complete defense to a claim of copyright infringement. *See also Fred Fischer, Inc. v. Dillingham*, 298 F. 145, 147 (S.D.N.Y. 1924) (L. Hand, J.) ("the law imposes no

of "Dentalab" or "Dentlab" violated neither federal nor state law, for, *inter alia*, those terms are merely general descriptions of goods and services, not names of particular products. App. at 504. Defendants counterclaimed that Whelan Associates had usurped defendants' copyright and that by continuing to sell Dentalab, Whelan Associates was engaging in unfair competition. App. at 505-11. By agreement of the parties, the trade secret action was removed from the Court of Common Pleas to the district court and became a counterclaim. App. at 509-12.

The first procedural blow was struck by the defendants, who moved almost immediately for a preliminary injunction to enjoin Whelan Associates from using Jaslow Labs' trade secrets. After a three-day hearing, the district court denied the motion in a bench opinion delivered on November 2, 1983. The court held that the defendants had not shown a likelihood of success on the merits because they had failed to prove that any of Jaslow Lab's trade secrets were in the Dentalab program. Moreover, the court held that the defendants' had not proven irreparable harm and that they had approached the court with "unclean hands" on account of their use of the term "Dentlab," which could be and was confused for Dentalab. App. 443-44; 446-47.

A quick victory proving beyond the defendants' reach, the parties prepared for a protracted battle. Discovery proceeded on each side, and a three-day bench trial began on July 9, 1984. At trial, Whelan Associates continued to press all of its claims -- copyright violations, unfair competition, and tortious interference with contractual relations. The defendants abandoned the trade secret claim that had

---

prohibition upon those who, without copying, independently arrive at the precise combination of words or notes which have been copyrighted.").

failed them in the preliminary injunction battle, but maintained their position that Rand Jaslow owned the copyright to Dentalab. Defendants continued to deny Whelan Associates' allegations.

The principal witnesses were Elaine Whelan, Rand Jaslow, and two expert witnesses, Dr. Thomas Moore for Whelan Associates and Stephen Ness on behalf of the defendants. Whelan and Jaslow testified about the dealings and negotiations between the parties. Dr. Moore and Mr. Ness examined the programs and testified about the programs' similarities and differences. Dr. Moore testified that although the Dentcom program was not a translation of the Dentalab system, the programs were similar in three significant respects. He testified that most of the file structures, and the screen outputs, of the programs were virtually identical. App. at 682-704 (file structures); *id.* at 681-82 (screen outputs). He also testified that five particularly important "subroutines" within both programs -- order entry, invoicing, accounts receivable, end of day procedure, and end of month procedure -- performed almost identically in both programs. App. at 704-18.[8] Mr. Ness compared the source and object codes[9] of the Dentalab, Dentcom, and Datamaster programs, *see supra* n. 4, and testified at length about the many ways that the programs differed from one another. He concluded that "substantive differences in programming style, in programming structure, in algorithms and data structures, all indicate that the Dentcom system is not directly derived from either of the other systems." App. at 823-24. In his written report, however, which was entered into evidence, Mr. Ness conceded that the

---

8. Dr. Moore's testimony is discussed in greater detail *infra* at 59-63.

9. Source and object code are defined *infra* at 19-20.

Dentalab and Dentcom programs had "overall structural similarities." App. at 1798.

The district court ruled for Whelan Associates on all grounds. *Whelan Associates v. Jaslow Dental Laboratory*, 609 F. Supp. 1307 (E.D. Pa. 1985). It found that Elaine Whelan was the sole author of the Dentalab system (and, hence, that Rand Jaslow was not a co-author) and that the contract between Strohl and Rand Jaslow, *see supra* n. 2, made clear that Strohl would retain full ownership over the software. *Whelan Associates v. Jaslow Dental Laboratory*, 609 F. Supp. at 1318-19. The court thus concluded that Whelan Associates' copyright in the Dentalab System was valid, and that Dentcom's sales of the Dentalab program were violations of that copyright.[10] *Id.* at 1320.

The court also found that Rand Jaslow had not created the Dentcom system independently, and that the Dentcom system, although written in a different computer language from the Dentalab, and although not a direct transliteration of Dentalab, was substantially similar to Dentalab because its structure and overall organization were substantially similar. *Id.* at 1321-22. (The district court's opinion on this point is described *infra* at 39). This substantial similarity, in conjunction with Rand Jaslow's acknowledged access to the Dentalab system, led the district court to conclude that each sale of the Dentcom program by Dentcom[11] violated Whelan Associates' copyright on the Dentalab system. The court therefore awarded Whelan Associates damages for these copyright infringements, and enjoined Dentcom from selling any more copies of the Dentalab or Dentcom programs. *Whelan Associates v. Jaslow Dental Laboratory*, 609

---

10. There were two such sales by Dentcom.

11. There were 23 such sales.

F. Supp. at 1322-23. The court also held that plaintiffs had exclusive use of the term "Dentalab," and enjoined defendants from using either "Dentalab" or "Dentlab" in their business. *Id.* at 1324-25.

The parties filed a series of post-trial motions, primarily concerned with damage calculations and attorneys fees. Upon the district court's disposition of these motions, *Whelan Associates v. Jaslow Dental Laboratory*, 609 F. Supp. 1325 (E.D. Pa. 1985), the defendants filed their notices of appeal.[12] On appeal, they raise a single issue: whether the district court erred in its finding that the Dentcom program infringes the copyright of plaintiffs' Dentalab system.

III. *TECHNOLOGICAL BACKGROUND*

We begin with a brief description of computer programs and an explanation of how they are written. This introduction is necessary to our analysis of the issues in this case.

A computer program is a set of instructions to the computer.[13] Most programs accept and process user-supplied data. The fundamental processes utilized by a program are called algorithms (mechanical computational procedures) and are at the heart of the program. *See* Keplinger, *Computer Software -- Its Nature and its Protection*, 30 Emory L. J. 483, 484-85 (1984). These algorithms must be developed by the human creativity of the programmer.

---

12. The appeal is from the court's injunction preventing defendants from selling the Dentcom program. The court has not yet entered a final judgment covering pre- and post-trial damages. Our jurisdiction is thus pursuant to 28 U.S.C. § 1292(a)(1).

13. Title 17 U.S.C. § 101 (1982), gives a more technical rendering, defining a computer program as "a set of statements or instructions to be used directly or indirectly in a computer in order to bring about a certain result."

and the program therefore cannot contain any algorithms not already considered by humans. Although a computer cannot think or develop algorithms, it can execute them faster and more accurately than any human possibly could. *See* R. Saltman, *Copyright in Computer-Readable Works* 59 (1977).

The creation of a program often takes place in several steps, moving from the general to the specific.[14] Because programs are intended to accomplish particular tasks, the first step in creating the program is identifying the problem that the computer programmer is trying to solve. In this case, Rand Jaslow went to Strohl and stated that his problem was recordkeeping for his business. Although this was an accurate statement of the problem, it was not specific enough to guide Elaine Whelan. Before she could write the Dentalab program, she needed to know more about Jaslow Lab's business -- how orders were processed, what special billing problems might arise, how inventory might be correlated to orders, and other characteristics of the dental prosthetics trade.

As the programmer learns more about the problem, she or he may begin to outline a solution. The outline can take the form of a flowchart, which will break down the solution into a series of smaller units called "subroutines" or "modules,"[15] each of which

---

14. More detailed descriptions of this process can be found in D. Bender, *Computer Law - Software Protection* § 2.06[3] (1985); Yohe, *An Overview of Programming Tactics*, 6 Computing Surveys 221 (1974).

15. Technically speaking, modules and subroutines are slightly different. *Compare* R. Andree, J. Andree & D. Andree, *Computer Programming* 336 (1973) (defining subroutines) *with* R. Coats, *Software Engineering for Small Computers* 12 (1983) (modules). For present purposes, however, they may be used synonymously as discrete parts of programs with readily identifiable tasks.

deals with elements of the larger problem. *See* Note, *Defining the Scope of Copyright Protection for Computer Software*, 38 Stan. L. Rev. 497, 500-01 (1986). A program's efficiency depends in large part on the arrangements of its modules and subroutines; although two programs could produce the same result, one might be more efficient because of different internal arrangements of modules and subroutines. Because efficiency is a prime concern in computer programs (an efficient program being obviously more valuable than a comparatively inefficient one), the arrangement of modules and subroutines is a critical factor for any programmer. In the present case, the Dentalab program had numerous modules pertaining to inventory, accounts receivable, various dentist-patient matters, and payroll, among others. *See* App. at 1588-1698 (showing flowcharts of subroutines). Some of the modules were simple; others were quite complex and involved fairly elaborate logical development.

As the program structure is refined, the programmer must make decisions about what data is needed, where along the program's operations the data should be introduced, how the data should be inputted, and how it should be combined with other data. The arrangement of the data is accomplished by means of data files, discussed *infra* at 49-52, and is affected by the details of the program's subroutines and modules, for different arrangements of subroutines and modules may require data in different forms. Once again, there are numerous ways the programmer can solve the data-organization problems she or he faces. Each solution may have particular characteristics -- efficiencies or inefficiencies, conveniences or quirks -- that differentiate it from other solutions and make the overall program more or

less desirable. Because the Dentalab program was intended to handle all of the business-related aspects of a dental laboratory, it had to accommodate and interrelate many different pieces and types of data including patients' names, dentists' names, inventory, accounts receivable, accounts payable, and payroll.[16]

Once the detailed design of the program is completed, the coding begins.[17] Each of the steps identified in the design must be turned into a language that the computer can understand. This translation process in itself requires two steps. The programmer first writes in a "source code," which may be in one of several languages, such as COBOL, BASIC, FORTRAN, or EDL.[18] The choice of language depends upon which computers the programmer intends the program to be used by, for some computers can read only certain languages.[19] Once the program is written in source code, it is translated into "object code," which is a binary code, simply a concatenation of "0"s and "1"s. In every program, it is the object code, not the source code, that directs the computer to perform functions.

---

16. Elaine Whelan's material on the various elements, files and subroutines of the Dentalab system are voluminous, taking up over 200 pages of the record. *See* App. at 1222-1469. The material consisted of detailed outlines on how the program was to be structured.

17. The discussion in this paragraph draws heavily from Note, *Copyright Protection of Computer Program Object Code*, 96 Harv. L. Rev. 1723, 1724-25 (1983).

18. We ignore the distinction between "high level language" and "assembly language," *see* Note, 96 Harv. L. Rev. 1723, 1725 (1983), which is not relevant to the issues in this case. Both of these may be referred to as "source codes." *See Apple Computer, Inc. v. Franklin Computer Corp.*, 714 F.2d 1240, 1243 (3d Cir. 1983), *cert. dismissed*, 464 U.S. 1033 (1984).

19. The IBM Series One, for example, can read EDL but not BASIC; the IBM-PC can read BASIC, but not EDL.

The object code is therefore the final instruction to the computer.[20, 21]

---

20. The discussion assumes that the program is "compiled" or "assembled." If a program is "interpreted," then the source and object codes are joined in a single step. Whether a program is compiled or interpreted depends on the program and the machine on which it is run. The difference is not important in this case.

21. There are three other facets of program creation, debugging, documentation, and maintenance. Although none of these functions are at issue in this case, in the interest of completeness we shall describe them here. After the object code has been completed, the program must be "debugged" and documented. Debugging, or error removal, is frequently a lengthy process, for any moderately difficult task may require a fairly detailed and complex program. *See* D. Bender, *supra*, § 2.06[3][e]. The program demands arduous debugging not only because of its complexity, but also because of its delicacy. Even slight and perhaps obvious errors can hinder a program, for a computer has no way of recognizing errors. Like a perfect soldier, it takes instructions without questioning them.

    Documentation is the general term for the material that a programmer must give to a user to explain how the program runs. Programs frequently come with pamphlets that explain the program's powers and limitations. The documentation must anticipate as many potential questions and exigencies as the programmer can imagine the user will face because most people do not understand computers and programs fully, and it would therefore be very difficult for users to solve their problems themselves. Thus, proper documentation should "document everything, continually assuming [that the users] are going to have an attack of amnesia next week." Brown, *Programming and Documenting Software Projects*, 6 Computing Surveys 213, 219 (Dec. 1974). *See also* Yohe, *supra* n. 14 at 221.

    Finally, programmers are also usually responsible for the maintenance of their programs. No matter how thorough the debugging and documentation, problems will likely arise as the user develops new needs for the program.

As this brief summary demonstrates, the coding process is a comparatively small part of programming. By far the larger portion of the expense and difficulty in creating computer programs is attributable to the development of the structure and logic of the program, and to debugging, documentation and maintenance, rather than to the coding. *See* Frank, *Critical Issues in Software* 22 (1983) (only 20% of the cost of program development goes into coding); Zelkowitz, *Perspective on Software Engineering*, 10 Computing Surveys 197-216 (June, 1978). *See also InfoWorld*, Nov. 11, 1985 at 13 ("the 'look and feel' of a computer software product often involves much more creativity and often is of greater commercial value than the program code which implements the product . . . "). The evidence in this case is that Ms. Whelan spent a tremendous amount of time studying Jaslow Labs, organizing the modules and subroutines for the Dentalab program, and working out the data arrangements, and a comparatively small amount of time actually coding the Dentalab program.

IV. *LEGAL BACKGROUND*

A. *The elements of a copyright infringement action* -- To prove that its copyright has been infringed, Whelan Associates must show two things: that it owned the copyright on Dentalab, and that Rand Jaslow copied Dentalab in making the Dentacom program. *Sid & Marty Krofft Television Prods., Inc. V. McDonald's Corp.*, 562 F.2d 1157, 1162 (9th Cir. 1977); *Reyher v. Children's Television Workshop*, 533 F.2d 87, 90 (2d Cir.), *cert. denied*, 429 U.S. 980 (1976); 3 *Nimmer On Copyright* § 13.01 (1985) [referred to hereinafter as "Nimmer"]. Although it was

---

The programmer, like a car manufacturer or dealer, must be prepared to fix latent bugs, adapt the program, or incur other so-called "life cycle" costs of maintenance.

disputed below, *see supra* 10-11, the district court determined, and it is not challenged here, that Whelan Associates owned the copyright to the Dentalab program. We are thus concerned only with whether it has been shown that Rand Jaslow copied the Dentalab program.

As it is rarely possible to prove copying through direct evidence, *Roth Greeting Cards v. United Card Co.*, 429 F.2d 1106, 1110 (9th Cir. 1970), copying may be proved inferentially by showing that the defendant had access to the allegedly infringed copyrighted work and that the allegedly infringing work is substantially similar to the copyrighted work. *Ferguson v. National Broadcasting Co.*, 584 F.2d 111, 113 (5th Cir. 1978); *Sid & Marty Krofft Television Prods. Inc.*, *supra*; *Universal Athletic Sales Co. v. Salkeld*, 511 F.2d 904, 907 (3d Cir.), *cert. denied*, 423 U.S. 863 (1975); *Midway Mfg. Co. v. Strohon*, 564 F. Supp. 741, 753 (N.D. Ill. 1983). The district court found, and there it is uncontested that Rand Jaslow had access to the Dentalab program, both because Dentalab was the program used in Jaslow Labs and because Rand Jaslow acted as a sales representative for Whelan Associates. *See Whelan Associates v. Jaslow Dental Laboratory*, 609 F. Supp. at 1314.[22] Thus, the sole question is whether there was substantial similarity between the Dentcom and Dentalab programs.[23]

---

22. The district court found, *inter alia*, that Rand Jaslow "had surreptitiously and without consent of either Strohl Systems or Whelan Associates obtained a copy of the [Dentalab] source code," *id.*, and that he had "utilized the source code in his attempt to develop the IBM-PC Dentcom program," *id.* at 1321.

23. Although not an issue in this case, *see infra* n. 47, it is important to note that even the showing of substantial similarity is not dispositive, for it is still open to the alleged infringer to prove that his work is an original creation, *see*

B. *The appropriate test for substantial similarity in computer program cases* -- The leading case of *Arnstein v. Porter*, 154 F.2d 464, 468-69 (2d Cir. 1946), suggested a bifurcated substantial similarity test whereby a finder of fact makes two findings of substantial similarity to support a copyright violation. First, the fact-finder must decide whether there is sufficient similarity between the two works in question to conclude that the alleged infringer used the copyrighted work in making his own. On this issue, expert testimony may be received to aid the trier of fact. (This is called the "extrinsic" test of substantial similarity. *Sid & Marty Krofft Television Prods., Inc. v. McDonald's Corp.*, 562 F.2d at 1164-65.) Second, if the answer to the first question is in the affirmative, the fact-finder must decide without the aid of expert testimony, but with the perspective of the "lay observer," whether the copying was "illicit," or "an unlawful appropriation" of the copyrighted work. (This is called an "intrinsic" test of substantial similarity. *Id.*) The *Arnstein* test has been adopted in this circuit. *See Universal Athletic Sales Co.*, 511 F.2d at 907.

The district court heard expert testimony. *See supra* 12-13; *infra* at 58-62. It did not bifurcate its analysis, however, but made only a single finding of substantial similarity. *See Whelan Asssociates v. Jaslow Dental Laboratory*, 609 F. Supp. at 1321-22. It would thus appear to have contravened the law of this circuit. Nevertheless, for the reasons that follow, we believe that the district court applied an appropriate standard.

---

supra n.7, or that the similarities between the works was not on account of copying but because both parties drew from common sources that were part of the public domain. The cause of the substantial similarity -- legitimate or not -- is a question of fact.

The ordinary observer test, which was developed in cases involving novels, plays, and paintings, and which does not permit expert testimony, is of doubtful value in cases involving computer programs on account of the programs' complexity and unfamiliarity to most members of the public. *See* Note, *Copyright Infringement of Computer Programs: A Modification of the Substantial Similarity Test*, 68 Minn. L. Rev. 1264, 1285-88 (1984). *Cf.* Note, *Copyright Infringement Actions: The Proper Role for Audience Reactions in Determining Substantial Similarity*, 54 S. Cal. L. Rev. 385 (1981) (criticizing lay observer standard when objects in question are intended for particular, identifiable audiences). Moreover, the distinction between the two parts of the *Arnstein* test may be of doubtful value when the finder of fact is the same person for each step: that person has been exposed to expert evidence in the first step, yet she or he is supposed to ignore or "forget" that evidence in analyzing the problem under the second step. Especially in complex cases, we doubt that the "forgetting" can be effective when the expert testimony is essential to even the most fundamental understanding of the objects in question.

On account of these problems with the standard, we believe that the ordinary observer test is not useful and is potentially misleading when the subjects of the copyright are particularly complex, such as computer programs. We therefore join the growing number of courts which do not apply the ordinary observer test in copyright cases involving exceptionally difficult materials, like computer programs, but instead adopt a single substantial similarity inquiry according to which both lay and expert testimony would be admissible. *See E.F. Johnson Co. v. Uniden Corp.*, 623 F. Supp. 1485, 1493 (D. Minn. 1985); *Hubco Data Products Corp. v. Management Assistance Inc.*, 2 Copyright L. Rep. (CCH) ¶ 25,529 (D. Idaho Feb. 3,

1983) (enunciating bifurcated test, but relying entirely on expert testimony); *Midway Mfg. Co. v. Strohon*, 564 F. Supp. 741, 752-53 (N.D. Ill. 1983) (relying entirely on expert testimony to find substantial similarity); *see also* Fed. R. Evid. 702 ("If [expert testimony] will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness . . . may testify thereto in the form of an opinion or otherwise."). That was the test applied by the district court in this case.[24]

C. *The arguments on appeal* -- On appeal, the defendants attack on two grounds the district court's holding that there was sufficient evidence of substantial similarity. First, the defendants argue that because the district court did not find any similarity between the "literal" elements (source and object code) of the programs, but only similarity in their overall structures, its finding of substantial similarity was incorrect, for the copyright covers only the literal elements of computer programs, not their overall structures. Defendants' second argument is that even if the protection of copyright law extends to "non-literal" elements such as the structure of computer programs, there was not sufficient evidence of substantial similarity to sustain the district court's holding in this case. We consider these arguments in turn.[25]

---

24. This circuit has once used the single substantial similarity inquiry advocated here in a computer copyright case. *See Williams Electronics v. Arctic International, Inc.*, 685 F.2d 870, 876 n.6 (3d Cir. 1982) (finding substantial similarity in computer programs without mentioning the *Arnstein* test). *Williams* did not explain why it did not use the bifurcated *Arnstein* test, nor did it distinguish *Universal Athletic Sales*. To the extent that *Williams* did these things *sub silentio*, our holding today is merely a ratification of *Williams* on this point.

25. Because the first argument involves solely a question of law, our review is plenary. The second argument involves

V. *THE SCOPE OF COPYRIGHT PROTECTION OF COMPUTER PROGRAMS*

It is well, though recently, established that copyright protection extends to a program's source and object codes. *Stern Elecs., Inc. v. Kaufman*, 669 F.2d 852, 855 n.3 (2d Cir. 1982) (source code); *Apple Computer, Inc. v. Franklin Computer Corp.*, 714 F.2d 1240, 1246-47 (3d Cir. 1983) (source and object code), *cert. dismissed*, 464 U.S. 1033 (1984); *Williams Elecs., Inc. v. Artic International, Inc.*, 685 F.2d 870 (3d Cir. 1982) (object code). In this case, however, the district court did not find any copying of the source or object codes, nor did the plaintiff allege such copying. Rather, the district court held that the Dentalab copyright was infringed because the *overall structure* of Dentcom was substantially similar to the overall structure of Dentalab. *Whelan Associates v. Jaslow Dental Laboratory*, 609 F. Supp. at 1321-22. The question therefore arises whether mere similarity in the overall structure of programs can be the basis for a copyright infringement, or, put differently, whether a program's copyright protection covers the structure of the program or only the program's literal elements, *i.e.*, its source and object codes.

Title 17 U.S.C. § 102(a)(1) extends copyright protection to "literary works," and computer programs are classified as literary works for the purposes of copyright. *See* H.R. Rep. No. 1476, 94th Cong., 2d Sess. 54, *reprinted in* 1976 U.S. Code Cong. & Ad. News 5659, 5667. The copyrights of other literary works can be infringed even when there is no

---

questions of fact, and we therefore apply the "clearly erroneous" standard of review. *See Original Appalachian Artworks, Inc. v. Toy Loft*, 684 F.2d 821, 825 n.4 (11th Cir. 1982); *International Luggage Registry v. Avery Products*, 541 F.2d 830, 831 (9th Cir. 1976).

substantial similarity between the works' literal elements. One can violate the copyright of a play or book by copying its plot or plot devices. *See, e.g., Twentieth Century-Fox Film Corp. v. MCA, Inc.*, 715 F.2d 1327, 1329 (9th Cir. 1983) (13 alleged distinctive plot similarities between *Battlestar Galactica* and *Star Wars* may be basis for a finding of copyright violation); *Sid & Marty Krofft Television Productions, Inc.*, 562 F.2d at 1167 (similarities between McDonaldland characters and H.R. Pufnstuf characters can be established by "'total concept and feel'" of the two productions (quoting *Roth Greeting Cards v. United Card Co.*, 429 F.2d 1106, 1110 (9th Cir. 1970)); *Sheldon v. Metro-Goldwyn Pictures Corp.*, 81 F.2d 49, 54-55 (1936); *Nichols v. Universal Pictures Corp.*, 45 F.2d 119, 121 (2d Cir. 1930) (copyright "cannot be limited literally to the text, else a plagiarist would escape by immaterial variations"). By analogy to other literary works, it would thus appear that the copyrights of computer programs can be infringed even absent copying of the literal elements of the program.[26] Defendants contend, however, that what is true of

---

26. Professor Nimmer distinguishes two ways that one work might be substantially similar to another: comprehensive nonliteral similarity, and fragmented literal similarity. 3 Nimmer at § 13.03[A]. *See also Warner Bros. v. American Broadcasting Cos.*, 720 F.2d 231, 240 (2d Cir. 1983) (noting distinction); *Smith v. Weinstein*, 578 F. Supp. 1297, 1303 (S.D.N.Y.) (same), *aff'd*, 738 F.2d 419 (2d Cir. 1984). The titles are suggestive of their meanings: comprehensive nonliteral similarity means "a similarity not just as to a particular line or paragraph or other minor segment, but [that] the fundamental essence or structure of one work is duplicated in another." 3 Nimmer at 13-20.1, while fragmented literal similarity means occasional, but not complete, word-for-word similarity. *Id.* In Professor Nimmer's terminology, we are concerned here only with comprehensive nonliteral similarity.

other literary works is not true of computer programs. They assert two principal reasons, which we consider in turn.

A. *Section 102(b) and the dichotomy between idea and expression* -- It is axiomatic that copyright does not protect ideas, but only expressions of ideas. This rule, first enunciated in *Baker v. Selden*, 101 U.S. 99 (1879), has been repeated in numerous cases. *See, e.g., Mazur v. Stein*, 347 U.S. 201, 217 (1954) ("Unlike a patent, a copyright gives no exclusive right to the art disclosed; protection is given only to the expression of the idea -- not the idea itself." (citation omitted)); *Universal Athletic Sales Co.*, 511 F.2d at 906; *Dymow v. Bolton*, 11 F.2d 690, 691 (2d Cir. 1926); *see generally* A. Latman, *The Copyright Law* 31-35 (5th ed. 1979); 1 Nimmer § 2.03[D]. The rule has also been embodied in statute. Title 17 U.S.C. § 102(b) (1982) states:

> In no case does copyright protection for an original work of authorship extend to any idea, procedure, process, system, method of operation, concept, principle, or discovery, regardless of the form in which it is described, explained, illustrated, or embodied in such work.

The legislative history of this section, adopted in 1976, makes clear that § 102(b) was intended to express the idea-expression dichotomy. *See* H.R. Rep. No. 1476 at 57 *reprinted in* 1976 U.S. Code Cong. & Ad. News at 5670 (§ 102(b) is intended to "restate . . . that the basic dichotomy between expression and idea remains unchanged.") *See also Apple Computer, supra*, 714 F.2d at 1252.

Defendants argue that the structure of a computer program is, by definition, the idea and not the expression of the idea, and therefore that the structure cannot be protected by the program copyright. Under the defendants' approach, any other decision would be

contrary to § 102(b). We divide our consideration of this argument into two parts. First, we examine the caselaw concerning the distinction between idea and expression, and derive from it a rule for distinguishing idea from expression in the context of computer programs. We then apply that rule to the facts of this case.

1. *A rule for distinguishing idea from expression in computer programs* -- It is frequently difficult to distinguish the idea from the expression thereof. No less an authority than Learned Hand, after a career that included writing some of the leading copyright opinions, concluded that the distinction will "inevitably be *ad hoc*." *Peter Pan Fabrics, Inc. v. Martin Weiner Corp.*, 274 F.2d 487, 489 (2d Cir. 1960). *See also* Knowles & Palmieri, *Dissecting* Krofft*: An Expression of New Ideas in Copyright?*, 8 San. Fern. Val. L. Rev. 109, 126 (1980) (arguing that there can be no meaningful distinction between idea and expression). Although we acknowledge the wisdom of Judge Hand's remark, we feel that a review of relevant copyright precedent will enable us to formulate a rule applicable in this case. In addition, precisely because the line between idea and expression is elusive, we must pay particular attention to the pragmatic considerations that underlie the distinction and copyright law generally. In this regard, we must remember that the purpose of the copyright law is to create the most efficient and productive balance between protection (incentive) and dissemination of information, to promote learning, culture and development. *See* U.S. Const. Art. I § 8 cl. 8 (Copyright Clause)(giving Congress the power to "promote the Progress of Science and useful Arts").[27]

---

27. Achieving the proper incentive has been a longstanding task of courts. *See, e.g., Sayre v. Moore*, 102 Eng. Rep. 138, 140 n.6 (1785) (Lord Mansfield):

We b[illegible]n our analysis with the case of *Baker v. Selden*, wh[illegible]h, in addition to being a seminal case in the law of copyright generally, is particularly relevant here because, like the instant case, it involved a utilitarian work, rather than an artistic or fictional one. In *Baker v. Selden*, the plaintiff Selden obtained a copyright on his book, "Selden's Condensed Ledger, or Bookkeeping Simplified," which described a new, simplified system of accounting. Included in the book were certain "blank forms," pages with ruled lines and headings, for use in Selden's accounting system. Selden alleged that Baker had infringed Selden's copyright by making and selling accounting books that used substantially the same system as Selden's and that reproduced Selden's blank forms. No one disputed that Baker had the right to use and promulgate Selden's system of accounting, for all parties agreed that the system could not be copyrighted, although the Court opined that it might be patentable. *Id.* at 102. Nor did the parties dispute that the text of Baker's book on accounting did not infringe Selden's copyright. The dispute centered on whether Selden's blank forms were part of the method (idea) of Selden's book, and hence

---

> [W]e must take care to guard against two extremes equally prejudicial: the one, that men of ability, who have employed their time for the service of the community, may not be deprived of their just merits, and the reward for their ingenuity and labour: the other, that the world may not be deprived of improvements, nor the progress of the arts be retarded.

See also *Twentieth Century Music Corp. v. Aiken*, 422 U.S. 151, 156 (1975); *Apple Computer*, 714 F.2d at 1253 (Sloviter, J.) ("the line must be a pragmatic one, which also keeps in consideration 'the preservation of the balance between competition and protection reflected in the patent and copyright laws.'" (*quoting Herbert Rosenthal Jewelry Corp. v. Kalpakian*, 446 F.2d 738, 742 (9th Cir. 1971))).

non-copyrightable, or part of the copyrightable text (expression). *Id.* at 101.

In deciding this point, the Court distinguished what was protectible from what was not protectible as follows:

> [W]here the art [*i.e.*, the method of accounting] it teaches cannot be used without employing the methods and diagrams used to illustrate the book, or such as are similar to them, such methods and diagrams are to be considered as necessary incidents to the art, and given to the public.

Id. at 103. Applying this test, the Court held that the blank forms were necessary incidents to Selden's method of accounting, and hence were not entitled to any copyright protection. *Id.* at 104.

The Court's test in *Baker v. Selden* suggests a way to distinguish idea from expression. Just as *Baker v. Selden* focused on the end sought to be achieved by Selden's book, the line between idea and expression may be drawn with reference to the end sought to be achieved by the work in question. In other words, *the purpose or function of a utilitarian work would be the work's idea, and everything that is not necessary to that purpose or function would be part of the expression of the idea. Cf. Apple Computer, Inc. v. Formula Int'l, Inc.*, 562 F. Supp. 775, 783 (C.D. Ca. 1983) ("Apple seeks here not to protect *ideas* (i.e. making the machine perform particular functions) but rather to protect their particular *expressions* . . ."), *aff'd*, 725 F.2d 521 (9th Cir. 1984). Where there are various means of achieving the desired purpose, then the particular means chosen is not necessary to the purpose; hence, there is expression, not idea.[28]

---

28. This test is necessarily difficult to state, and it may be difficult to understand in the abstract. It will become more

Consideration of copyright doctrines related to *scenes a faire* and fact-intensive works supports our formulation, for they reflect the same underlying principle. *Scenes a faire* are "incidents, characters or settings which are as a practical matter indispensable . . . in the treatment of a given topic." *Atari, Inc. v. North American Philips Consumer Elecs. Corp.*, 672 F.2d 607, 616 (7th Cir.), *cert. denied*, 459 U.S. 880 (1982). *See also See v. Durang*, 711 F.2d 141, 143 (9th Cir. 1983). It is well-settled doctrine that *scenes a faire* are afforded no copyright protection.[29]

Scenes a faire are afforded no protection because the subject matter represented can be expressed in no other way than through the particular *scene a faire*. Therefore, granting a copyright "would give the first author a monopoly on the commonplace ideas behind the *scenes a faire*." *Landsberg v. Scrabble Crossword Game Players, Inc.*, 736 F.2d at 489.[30] This is merely a

---

clear as we discuss and explain it in the textual discussion that follows this footnote. *See also infra* at 49-52 (discussion of the copyrightability of file structures that raise many of the issues considered here). As will be seen, *see infra* at 38-39, the idea of the Dentalab program was the efficient management of a dental laboratory (which presumably has significantly different requirements from those of other businesses). Because that idea could be accomplished in a number of different ways with a number of different structures, the structure of the Dentalab program is part of the program's expression, not its idea.

29. *See Landsberg v. Scrabble Crossword Game Players, Inc.*, 736 F.2d 485, 489 (9th Cir.), *cert. denied*, ___ U.S. ___, 105 S.Ct. 513 (1984); *See v. Durang*, 711 F.2d at 143; *Hoehling v. Universal City Studios, Inc.*, 618 F.2d 972, 979 (2d Cir. 1980).

30. *Hoehling*, 618 F.2d at 979 (explaining the *scenes a faire* doctrine as follows: "Because it is virtually impossible to write about a particular historical era or fictional theme without employing certain 'stock' or standard literary devices, we have held that *scenes a faire* are not

restatement of the hypothesis advanced above, that the purpose or function of a work or literary device is part of that device's "idea" (unprotectible portion). It follows that anything necessary to effecting that function is also, necessarily, part of the idea, too.

Fact intensive works are given similarly limited copyright coverage. *See, e.g., Landsberg*, 736 F.2d at 488; *Miller v. Universal City Studios, Inc.*, 650 F.2d 1365, 1372 (5th Cir. 1981). Once again, the reason appears to be that there are only a limited number of ways to express factual material, and therefore the purpose of the literary work -- telling a truthful story -- can be accomplished only by employing one of a limited number of devices. *Landsberg*, 736 F.2d at 488. Those devices therefore belong to the idea, not the expression, of the historical or factual work.

Although the economic implications of this rule are necessarily somewhat speculative, we nevertheless believe that the rule would advance the basic purpose underlying the idea/expression distinction, "the preservation of the balance between competition and protection reflected in the patent and copyright laws." *Herbert Rosenthal Jewelry Corp. v. Kalpakian*, 446 F.2d 738, 742 (9th Cir. 1971); *see also Apple Computer*, 714 F.2d at 1253 (quoting *Kalpakian*); *supra* n. 27. As we stated above, *see supra* at 21, among the more significant costs in computer programming are those attributable to developing the structure and logic of the program. The rule proposed here, which allows copyright protection beyond the literal computer code,[31] would provide the proper

---

copyrightable as a matter of law."); *cf. Dymow v. Bolton*, 11 F.2d at 691 ("[I]f the same idea can be expressed in a plurality of totally different manners, a plurality of copyrights may result. . .").

31. As we discuss below, *see infra* n. 34, not all non-literal elements are essential to a given computer program.

incentive for programmers by protecting their most valuable efforts, while not giving them a stranglehold over the development of new computer devices that accomplish the same end.

The principal economic argument used against this position -- used, that is, in support of the position that programs' literal elements are the only parts of the programs protected by the copyright law -- is that computer programs are so intricate, each step so dependent on all of the other steps, that they are almost impossible to copy except literally, and that anyone who attempts to copy the structure of a program without copying its literal elements must expend a tremendous amount of effort and creativity. In the words of one commentator: "One cannot simply 'approximate' the entire copyrighted computer program and create a similar operative program without the expenditure of almost the same amount of time as the original programmer expended." Note, 68 Minn. L. Rev. at 1290 (footnote omitted). According to this argument, such work should not be discouraged or penalized. A further argument against our position is not economic but jurisprudential: another commentator argues that the concept of structure in computer programs is too vague to be useful in copyright cases. Radcliffe, *Recent Developments in Copyright Law Related to Computer Software*, 4 Computer L. Rep. 189, 194-97 (1985). He too would therefore appear to advocate limiting copyright protection to programs' literal codes.

Neither of the two arguments just described is persuasive. The first argument fails for two reasons. In the first place, it is simply not true that "approximation" of a program short of perfect reproduction is valueless. To the contrary, one can approximate a program and thereby gain a significant advantage over competitors even though additional

work is needed to complete the program. Second, the fact that it will take a great deal of effort to copy a copyrighted work does not mean that the copier is not a copyright infringer. The issue in a copyrighted case is simply whether the copyright holder's expression has been copied, not how difficult it was to do the copying. Whether an alleged infringer spent significant time and effort to copy an original work is therefore irrelevant to whether he has pirated the expression of an original work.[32]

As to the second argument, it is surely true that limiting copyright protection to computers' literal codes would be simpler and would yield more definite answers than does our answer here. Ease of application is not, however, a sufficient counterweight to the considerations we have adduced on behalf of our position.

Finally, one commentator argues that the process of development and progress in the field of computer programming is significantly different from that in other fields, and therefore requires a particularly restricted application of the copyright law. According to this argument, progress in the area of computer technology is achieved by means of "stepping-stones," a process that "requires plagiarizing in some manner the underlying copyrighted work." Note, 68 Minn. L. Rev. at 1292 (footnote omitted). As a consequence, this commentator argues, giving computer programs too much copyright protection will retard progress in the field.

---

32. Even if the product of the alleged infringer's efforts is a mixture of old and new elements, that would not protect it from the charge of infringement. Parodies, for example, mix copied elements with originality, yet they can violate the copyright of the work being parodied. *See generally* Note, *The Parody Defense to Copyright Infringement: Productive Fair Use After* Betamax, 97 Harv. L. Rev. 1395 (1984).

We are not convinced that progress in computer technology or technique is qualitatively different from progress in other areas of science or the arts. In balancing protection and dissemination, *see supra* at 31 & n. 27, the copyright law has always recognized and tried to accommodate the fact that all intellectual pioneers build on the work of their predecessors.[33] Thus, copyright principles derived from other areas are applicable in the field of computer programs.

2. *Application of the general rule to this case* -- The rule proposed here is certainly not problem-free. The rule has its greatest force in the analysis of utilitarian or "functional" works, for the purpose of such works is easily stated and identified. By contrast, in cases involving works of literature or "non-functional" visual representations, defining the purpose of the work may be difficult. Since it may be impossible to discuss the purpose or function of a novel, poem, sculpture or painting, the rule may have little or no application to cases involving such works. The present case presents no such difficulties, for it is clear that the purpose of the utilitarian Dentalab program was to aid in the business operations of a dental laboratory.[34] *See supra* 4-5. It is equally clear

---

33. Long before the first computer, Sir Issac Newton humbly explained that "if [he] had seen farther than other men, it was because [he] had stood on the shoulders of giants."

34. We do not mean to imply that the idea or purpose behind *every* utilitarian or functional work will be precisely what it accomplishes, and that structure and organization will therefore always be part of the expression of such works. The idea or purpose behind a utilitarian work may be to accomplish a certain function *in a certain way*, *see, e.g., Baker v. Selden*, 101 U.S. at 100 (referring to Selden's book as explaining "a peculiar system of book-keeping"), and the structure or function of a program might be essential to that task. There is no suggestion in the record, however,

that the structure of the program was not essential to that task: there are other programs on the market, competitors of Dentalab and Dentcom, that perform the same functions but have different structures and designs.

This fact seems to have been dispositive for the district court:

> The mere idea or concept of a computerized program for operating a dental laboratory would not in and of itself be subject to copyright. Copyright law protects the manner in which the author expresses an idea or concept, but not the idea itself. *Albert E. Price v. Metzner*, 574 F. Supp. 281 (E.D. Pa. 1983). Copyrights do not protect ideas -- only expressions of ideas. *Universal Athletic Sales Co. v. Salkeld*, 511 F.2d 904, 908 (3d Cir. 1975). There are many ways that the same data may be organized, assembled, held, retrieved and utilized by a computer. *Different computer systems may functionally serve similar purposes without being copies of each other. There is evidence in the record that there are other software programs for the business management of dental laboratories in competition with plaintiff's program. There is no contention that any of them infringe although they may incorporate many of the same ideas and functions.* The 'expression of the idea' in a software computer program is the manner in which the program operates, controls and regulates the computer in receiving, assembling, calculating, retaining,

---

that the purpose of the Dentalab program was anything so refined: it was simply to run a dental laboratory in an efficient way.

> correlating, and producing useful information either on a screen, print-out or by audio communication.

Whelan Associates v. Jaslow Laboratory, 609 F. Supp. at 1320 (emphasis added). We agree. The conclusion is thus inescapable that the detailed structure of the Dentalab program is part of the expression, not the idea, of that program.

Our conclusion is supported by *SAS Institute, Inc. v. S&H Computer Systems, Inc.*, 605 F. Supp. 816 (M.D. Tenn. 1985), the only other case that has addressed this issue specifically, in which the court found that a program's copyright could extend beyond its literal elements to its structure and organization. In *SAS*, plaintiffs supported their allegation of copyright infringement of their computer program with evidence of both literal and organizational similarities between its program and the alleged infringer. *Id.* at 822, 825-26. The court found a copyright infringement, and although it did not discuss in detail its evaluation of the evidence, it is apparent that the organizational similarities of the programs were relevant to its decision. After a brief discussion of the programs' literal similarities, the court said:

> In addition, the copying proven at trial does not affect only the specific lines of code cited by Dr. Peterson in his testimony. Rather, to the extent that it represents copying of the organization and structural details of SAS, such copying pervades the entire S&H product.

Id. at 830. Although the *SAS* court did not analyze the point in great depth, we are encouraged by its conclusion.

The Copyright Act of 1976 provides further support, for it indicates that Congress intended that

the structure and organization of a literary work could be part of its expression protectible by copyright. Title 17 U.S.C. § 103 (1982) specifically extends copyright protection to compilations and derivative works. Title 17 U.S.C. § 101, defines "compilation" as "a work formed by the collection and *assembling* of preexisting materials or of data that are selected, *coordinated, or arranged* in such a way that the resulting work as a whole constitutes an original work of authorship," and it defines "derivative work," as one "based upon one or more preexisting works, such as . . . *abridgement, condensation*, or any other form in which a work may be *recast*, transformed, or adapted." (emphasis added). Although the Code does not use the terms "sequence," "order" or "structure," it is clear from the definition of compilations and derivative works, and the protection afforded them, that Congress was aware of the fact that the sequencing and ordering of materials could be copyrighted, *i.e.*, that the sequence and order could be parts of the expression, not the idea, of a work.

Our solution may put us at odds with Judge Patrick Higginbotham's scholarly opinion in *Synercom Technology, Inc. v. University Computing Co.*, 462 F. Supp. 1003 (N.D. Tex. 1978), which dealt with the question whether the "input formats" of a computer program -- the configurations and collations of the information entered into the program -- were idea or expression. The court held that the input formats were ideas, not expressions, and thus not protectible. *Synercom* did not deal with precisely the materials at issue here -- input formats are structurally simple as compared to full programs -- and it may therefore be distinguishable. However, insofar as the input formats are devices for the organization of data into forms useful for computers, they are *similar* to programs: thus, *Synercom* is relevant and we must come to grips with it.

Central to Judge Higginbotham's analysis was his conviction that the organization and structure of the input formats was inseparable from the idea underlying the formats. Although the court acknowleged that in some cases structure and sequence might be part of expression, not idea, *see id.* at 1014, it stated that in the case of input formats, structure and organization were inherently part of the idea. The court put its position in the form of a powerful rhetorical question: "if sequencing and ordering [are] expression, what separable idea is being expressed?" *Id.* at 1013.

To the extent that *Synercom* rested on the premise that there was a difference between the copyrightability of sequence and form in the computer context and in any other context, we think that it is incorrect. As just noted, the Copyright Act of 1976 demonstrates that Congress intended sequencing and ordering to be protectible in the appropriate circumstances, *see supra* p. 41, and the computer field is not an exception to this general rule. Although Congress was aware that computer programs posed a novel set of issues and problems for the copyright law, Congress did not then make, and has not since made, any special provision for ordering and sequencing in the context of computer programs. There is thus no statutory basis for treating computer programs differently from other literary works in this regard.[35]

---

35. See also Mooers, *Computer Software and Copyright*, 7 Computing Surveys ___, 50 (March 1975) ("Also included in the 'expression' is the sequence, choice, and arrangment of descriptive elements . . . ."). Two commentators have criticized *Synercom* for its refusal to permit sequencing and ordering in the computer context to constitute expression. *See* Pierce, *Copyright Protection for Computer Programs*, 30 Copyright Law Symposium 1, 19 (1983) (*Synercom* "stands alone . . . [in denying] copyright

Despite the fact that copyright protection extends to sequence and form in the computer context, unless we are able to answer Judge Higginbotham's powerful rhetorical question -- "if sequencing and ordering [are] expression, what separable idea is being expressed?" -- in our own case, we would have to hold that the structure of the Dentalab program is part of its idea and is thus not protectible by copyright. Our answer has already been given, however: the idea is the efficient organization of a dental laboratory (presumably, this poses different problems from the efficient organization of some other kinds of laboratories or businesses). Because there are a variety of program structures through which that idea can be expressed, the structure is not a necessary incident to that idea.[36] *See supra* 39.

---

protection when the sequence and arrangement of data had been expressed by others in different ways." (footnote omitted)): Note, *Defining the Scope of Copyright Protection for Computer Software*, 38 Stan. L. Rev. 497, 525 (1986) (criticizing *Synercom* on the ground that "sequence and arrangement are expression that is separable from the underlying utilitarian purpose of the [input] formats, which is to enable the user to communicate with the computer program." (footnote omitted)). The notewriter concluded that "copyright law should . . . recognize that organizing and connecting the modules and subroutines is a protectible act of authorship." *Id.* at 526.

36. It is not clear whether the end sought to be accomplished by the input formats involved in *Synercom* could be accomplished with different sequences and orders. *Compare* 462 F. Supp. at 1013 ("there are many . . . possible choices of computer formats, and the decision among them [is] arbitrary") *with id.* at 1014 ("The 'idea or principle' behind the forms in question, and the 'method or system' involved in them, [are] no more or less than the formats."). Moreover, as noted above, the input formats involved in *Synercom* are not identical to the structures of computer programs that concern us here.

B. *The CONTU Report* -- Defendants' second argument against copyright protection for non-literal elements of computer programs relies not on venerable principles of copyright law, but on the report of a special congressional commission. In 1974, concerned that the rapidly developing field of computer technology was outpacing the extant copyright laws, Congress passed Pub. L. 93-573, § 201, 88 Stat. 1873 (1974) creating the National Commission on New Technological Uses of Copyrighted Works (CONTU) to study and report on the problems and issues of new technology and copyright.

In 1976, before CONTU reported its findings to Congress, Congress passed a new copyright law to replace the one that had prevailed since 1909. Pub.L. No. 94-553, 90 Stat. 2541 (1976) (*codified at* 17 U.S.C. § 101 *et seq.*). The new law's only explicit accommodation to computer technology was 17 U.S.C. § 117, which dealt with copyright issues arising upon certain uses of computer programs not in issue here.

The Commission's Final Report [hereinafter "CONTU Report"] was delivered to the President on July 31, 1978. The CONTU Report recommended legislation:

> The new copyright law should be amended: (1) to make it explicit that computer programs, to the extent that they embody an author's original creation, are proper subject matter for copyright; (2) to apply to all computer uses of copyrighted programs by the deletion of the present section 117; and (3) to ensure that rightful possessors of copies of computer programs may use or adapt these copies for their use.

CONTU Report at 1. Congress responded to these suggestions in the 1980 Computer Software Copyright

Act by adding a provision to 17 U.S.C. § 101 defining computer programs. *see* Pub. L. No. 96-517, § 10(a), 94 Stat. 3028 (1980) (*codified at* 17 U.S.C. § 101) (*quoted supra* n. 13). It also replaced the old § 117 with a new § 117 outlining users' rights of adaptation.

As neither the definition of "computer program" nor 17 U.S.C. § 117 is relevant here, it would appear that the CONTU Report is of marginal relevance, at best. Nevertheless, defendants argue that it is not only relevant, but that it compels a decision in their favor. Specifically, defendants argue that the CONTU Report recommends that copyright protection be limited to protection of the literal elements of computer programs, and that the CONTU Report is to be taken as authoritative legislative history, which this court is bound to follow. Appellants' Br. at 15-21. This argument is unpersuasive, however.

In the first place, the CONTU Report never suggests that copyright protection should be limited to the literal code. To the contrary, in discussing the limits of copyright protection, the Report referred to the dichotomy between idea and expression discussed above, and said:

> [T]he separation of idea from form of expression . . . is better realized through the courts exercising their judgment in particular cases [than by a *per se* rule]. . . . *Flow charts*, source codes, and object codes are works of authorship in which copyright subsists . . . .

CONTU Report at 21 (emphasis added). While the first part of this passage suggests that the Commission may have reserved judgment as to the copyrightability of non-literal elements of computer programs, the second part -- particularly the reference to the copyrightability of flowcharts -- demonstrates that the Commission intended copyright protection to extend beyond the

literal code. Thus, the CONTU Report does not support defendants' position in this case.[37]

Even if the CONTU Report had advocated a strict limitation of the copyrightability of computer programs, defendants' argument would still fail, for the CONTU Report is not binding on us in this case. Defendants correctly note that some courts have treated the CONTU Report as a surrogate legislative history. *See, e.g., Micro-Sparc, Inc. v. Amtype Corp.*, 592 F. Supp. 33, 35 n.7 (D. Mass. 1984) ("The CONTU Report . . . comprises the entire legislative history of § 117."); *Midway Mfg. Co. v. Strohon*, 564 F. Supp. 741, 750 n.6. The courts have said this because Congress adopted the CONTU Report's recommendations without alterations and without any committee reports. Defendants argue that this court, too, is bound by the CONTU Report for the same reason.

The argument fails, however, for the only statutory provision relevant to this case is § 102(b), *see supra* 29-30, in which no changes were made as a result of the CONTU Report. Therefore, it follows that the CONTU Report cannot be a substitute for legislative history in this case. In effect, defendants ask us to apply the precepts of the CONTU Report regardless of what legislative provision we are considering. We cannot do this, however, for the CONTU Report has force only insofar as it can be said to represent the will of Congress. There is no sense in which it represents

---

37. The defendants also rely on statements (not included in the CONTU Report) of individual members of the Commission and of testimony before the Commission. *See* Appellants' Br. at 16-17, 18-21. This extrinsic evidence is weak, however, and cannot outweigh the explicit statement of the CONTU Report itself.

the will of Congress with respect to provisions not amended in response to the Report.[38]

VI. *EVIDENCE OF SUBSTANTIAL SIMILARITY*

Defendants' second argument is that even if copyright protection is not limited to computer programs' literal elements as a matter of law, there is insufficient evidence of substantial similarity presented in this case to support a finding of copyright infringement. The defendants claim that all three parts of Dr. Moore's expert testimony as to the similarity of the programs, *see supra* at 12-13, were flawed, and

---

38. Defendants' final argument as to the protectability of program structures is that the Copyright Office has taken the position that the defendants advocate here, and that as the Copyright Office is the agency responsible for the administration of the copyright laws, we should grant deference to its interpretation. In support of its position, the defendants refer us to the Copyright Office's Circular R61 (May 1983).

> EXTENT OF COPYRIGHT PROTECTION
>
> Copyright protection extends to the literary or textual expression contained in the computer program. Copyright protection is not available for ideas, program logic, algorithms, systems, methods, concepts, or layouts.

Circular R61 (May, 1983). Copyright Office circulars are not technical documents, but are "intended to present simple explanations of the law," for lay persons. Declaration of Arthur J. Levine, former Assistant Chief of the Copyright Office Examining Division and member of CONTU Commission. It is therefore questionable whether the circular deserves great deference on a matter so complex as this one. At any rate, without analyzing the circular in depth -- and its import is far from clear -- we feel that the argument and evidence we have set forth in the text are sufficient support for our position and that to the extent the Copyright Office's circular differs, it should not be followed.

also that the district court erred in evaluating the relative weight of Dr. Moore's and Mr. Ness' testimony. We consider these arguments in turn.

A. *File structures* -- Defendants claim that Dr. Moore's examination and conclusions with respect to file structures are irrelevant to the question whether there was a copyright violation. Defendants analogize files to blank forms, which contain no information but merely collect and organize information that is entered from another source. They argue, relying on *Baker v. Selden*, that, as a matter of law, blank forms cannot be copyrighted. Thus, they conclude, neither can file structures be part of the copyright of a program. *See* Appellants' Br. at 34-38; Reply Br. at 7-8.[39]

Defendants' description of the file structures is indeed correct. Dr. Moore himself described a computer's file as "a storage place for data, and it's really no different in a computer than it is in a file drawer, it's like a manila folder that contains all the data on a particular subject category in a computer." App. at 682. (Another analogy, particularly accessible

---

39. As will be seen below, defendants' argument here parallels their argument discussed in V.A. Defendants again rely on the idea-expression dichotomy and argue that computer files embody ideas and not expressions. The thrust of defendants' argument is that mere organization or ordering cannot be expression, but must be idea. Once again, we reject the argument. We separate the discussion here from the one in V.A. for two reasons. First, whereas defendants' first argument was that the structure of the whole program was classifiable as idea, not expression, the argument here is that a certain part of the program -- the file structure -- is idea, not expression. Thus, although the form of the arguments is the same, the subject is different. Second, in our analysis of the file structures, we are aided by the clear precedents and close analogy of blank forms, discussed *infra*. The law surrounding blank forms is particularly appropriate to the question of computer file structures.

to lawyers, is to a very complex cataloguing structure like the structure of Lexis or Westlaw without any entries yet made.) Defendants' legal conclusion is not correct, however. Although some courts have stated that the meaning of *Baker v. Selden* is that blank forms cannot be copyrighted,[40] this circuit, like the majority of courts that have considered the issue,[41] has rejected this position and instead have held that blank forms may be copyrighted if they are sufficiently innovative that their arrangement of information is itself informative. *Apple Computer, Inc.*, 714 F.2d at 1250. *See also Manpower, Inc. v. Temporary Help of Harrisburg, Inc.*, 246 F. Supp. 788 (E.D. Pa. 1965) (upholding copyrightability of form for vacation schedules).[42]

---

40. See, e.g., *Brown Instrument Co. v. Warner*, 161 F.2d 910, 911 (D.C. Cir.), *cert. denied*, 332 U.S. 801 (1947); *Taylor Instrument Companies v. Fawley-Brost Co.*, 139 F.2d 98, 100-01 (7th Cir. 1943), *cert. denied*, 321 U.S. 785 (1944).

41. See, e.g., *Edwin K. Williams & Co. v. Edwin K. Williams & Co. -- East*, 542 F.2d 1053 (9th Cir. 1976) (gas station account books held copyrightable), *cert. denied*, 433 U.S. 908 (1977); *Baldwin Cooke Co. v. Keith Clarke, Inc.*, 383 F. Supp. 650, 652, 655 (N.D. Ill.) ("a combined calendar, appointment, diary and information book" is "much more than a mere diary," and is thus copyrightable), *aff'd per curiam*, 505 F.2d 1250 (7th Cir. 1974); *Harcourt Brace & World Inc. v. Graphic Controls Corp.*, 329 F. Supp. 517 (S.D.N.Y. 1971) (answer sheets for recording multiple choice achievement and intelligence test answers held copyrightable). *See also* 1 Nimmer § 2.08[D][1]; *id.* § 2.18[C][1] (articulating and endorsing the "narrow" reading used by these courts, as contrasted by the "broad" reading illustrated in Brown, *supra*, and *Taylor Instrument*, *supra*); A. Latman, *The Copyright Law* 29-31 (5th ed. 1979) (collecting cases).

42. It is unclear whether the Copyright Office's regulation would permit copyright protection for blank forms or would

This is not to say that *all* blank forms or computer files are copyrightable. Only those that by their arrangement and organization convey some information can be copyrighted. *Cf.* 1 Nimmer at 2-201: "Thus books intended to record the events of baby's first year, or a record of a European trip, or any one of a number of other subjects, may evince considerable originality in suggestions of specific items of information which are to be recorded, and in the arrangement of such items." (footnote omitted). Defendants do not contend, however, that the file structures convey no information, and it appears to us that the structures are sufficiently complex and detailed that such an argument would not succeed. As we have noted, *supra* at 39, there are many ways in which the same goal -- the organization of the business aspects of a dental laboratory -- might be accomplished, and several of these approaches might use significantly different file stuctures.[43] The file

---

impose a *per se* rule against such protection. Title 37 C.F.R. § 202.1(c) (1985) denies copyright protection to

> Blank forms such as time cards, graph paper, account books, diaries, bank checks, scorecards, address books, report forms, order forms and the like, which are designed for recording information and do not in themselves convey information.

To the extent that the regulations do impose a *per se* rule against the copyrightability of blank forms, they have been criticized, *see* 1 Nimmer § 2.08[D][1]; *id.* at § 2.18[C][1], and have not been followed, *see supra* n. 41 (collecting cases).

43. Defendants' expert, Mr. Ness, testified that, given the problem to be solved, there were in fact few possible, efficient, file structures, and that the similarity in the programs' file structures was therefore neither surprising nor probative. *See* App. at 834-37. The district court apparently did not find Mr. Ness persuasive on this point, however, and we defer to the court's assessment. Had the defendants offered more evidence to support their position,

structures in the Dentalab and Dentcom systems require certain information and order that information in a particular fashion. Other programs might require different information or might use the same information differently. When we compare the comprehensiveness and complexity of the file structures at issue here with the "blank forms" at issue in the cases mentioned above, we have no doubt that these file structures are sufficiently informative to deserve copyright protection.

B. *Screen outputs* -- Defendants' second line of argument is slightly confusing. Defendants appear to argue that to the extent that the district court relied upon the similarity of the screen outputs of Dentalab and Dentcom its finding of substantial similarity was erroneous because (1) the screen outputs are covered by a different copyright from the program's, and/or (2) the screen outputs bear no relation to the programs that produce them. Although these arguments are not always clearly distinguished, Appellants' Br. at 38-41; Reply Br. at 8-10, the distinction is important because whereas the first argument is weak, we feel that the second is more persuasive.

It is true that screen outputs are considered audio-visual works under the copyright code, *see Williams Electronics*, 685 F.2d at 874; *Midway Manufacturing Co.*, 564 F. Supp. at 749 (distinguishing audiovisual copyright in display of videogame from copyright in program that creates the audiovisual display), and are thus covered by a

---

our answer might have been different. It is true that for certain tasks there are only a very limited number of file structures available, and in such cases the structures might not be copyrightable and similarity of file structures might not be strongly probative of similarity of the program as a whole. We are simply not convinced that this is such a case.

different copyright than are programs, which are literary works, *see supra* at 27. It is also true that Whelan Associates asserts no claim of copyright infringement with respect to the screen outputs. But the conclusion to be drawn from this is not, as defendants would have it, that screen outputs are completely irrelevant to the question whether the copyright in the program has been infringed. Rather, the only conclusion to be drawn from the fact of the different copyrights is that the screen ouput cannot be *direct* evidence of copyright infringement. There is no reason, however, why material falling under one copyright category could not be indirect, inferential evidence of the nature of material covered by another copyright.

Thus, the question is whether the screen outputs have probative value concerning the nature of the programs that render them sufficient to clear the hurdles of Fed. R. Evid. 401 and 403. The defendants argue that the screen outputs have *no* probative value with respect to the programs because many different programs can create the same screen output. Defendants rely on *Stern Electronics Inc. v. Kaufman*, 669 F.2d at 855 ("many different computer programs can produce the same 'results,' whether those results are an analysis of financial records or a sequence of images and sounds."), and *Midway Manufacturing Co.*, 564 F. Supp. at 749 ("it is quite possible to design a game that would infringe Midway's audiovisual copyright but would use an entirely different computer program."). Neither court, however, was presented with the question that faces us today, the evidentiary value of screen outputs in a suit for infringement of the underlying program.[44]

---

44. *Stern Electronics* was simply explaining a party's decision to copyright the underlying program rather than the screen output. *Midway Manufacturing*'s discussion was a part of

Insofar as everything that a computer does, including its screen outputs, is related to the program that operates it, there is necessarily a causal relationship between the program and the screen outputs. The screen outputs must bear *some* relation to the underlying programs, and therefore they have some probative value. The evidence about the screen outputs therefore passes the low admissibility threshold of Fed. R. Evid. 401.[45]

It is still possible, of course, that the risk of unfair prejudice would outweigh the probative value of the evidence, thus contravening Fed. R. Evid. 403. In support of this position one might argue that, because the screen outputs are vivid and easily understood (at least as compared with the obscure details of computer programs), they might have disproportionate influence

---

its holding that a computer program for audiovisual games is copyrightable separately from the video display. Our analysis is perfectly consistent with this position. *See supra* at 53.

45. Our holding that evidence of screen outputs may be admissible does not necessarily mean that such evidence would be alone sufficient to withstand motions of summary judgment or directed verdict.

Judge Rosenn believes that ordinarily and in the circumstances of this case, screen outputs have no probative worth in determining whether one computer program is copied from another. Different program codes in different computer languages are capable of producing identical screen outputs. To the extent that the district court relied on the screen outputs as evidence of copying, he believes it erred. He concludes such error was harmless, however, in light of all the evidence of copying, the access to and use of the plaintiff's source code, the similarity in the structure of the programs and in the flow charts. This court will not reverse a district court's factual determination in a non-jury trial where there is sufficient evidence in the record to support it, other than the challenged evidence. *DeLaval Turbine, Inc. v. West Indies Industries, Inc.*, 502 F.2d 259, 263-64 (3d Cir. 1974).

on the trier of fact. However, because the portions of programs that relate to the screen outputs are often so small a part of the full program, they might say very little about the underlying program. This combination of ease of perception and slight probative value, the argument concludes, works a Rule 403 violation because the screen outputs *appear* significantly more probative than they in fact can be.

This argument has force, but we feel that it is ultimately unpersuasive. In the first place, the defendants point to no place in the record where they objected to testimony about the screens' similarities. Our independent review of the record has revealed no such objections. *See, e.g.*, App. at 681-82 (Dr. Moore testifying about screen similarities without objection from defendants). Therefore, because this could not be plain error, the objection was waived. Second, even if the objection had not been waived, we do not believe that admission of the evidence relating to screen similarity suffices for a Rule 403 exclusion. Screen outputs are not so enticing that a trier of fact could not evaluate them rationally and with a cool head. The party against whom the screen outputs are introduced can easily explain their limited probative value. Given the substantial deference with which we review the district court's decision on this matter, *see McQueeney v. Wilmington Trust Co.*, 779 F.2d 916, 922 (3d Cir. 1985), and the parties' ample opportunities to advance their arguments before the district court, we do not believe that the district court committed error in considering the evidence relating to screen outputs.

C. *The five subroutines* -- With respect to the final piece of evidence, Dr. Moore's testimony about the five subroutines found in Dentalab and Dentcom, defendants state that they "fail to understand how a substantial similarity in *structure* can be established by a comparison of only a small fraction of the two

works." Appellants' Brief at 43, *see also* Reply Br. at 12. The premise underlying this declaration is that one cannot prove substantial similarity of two works without comparing the entirety, or at least the greater part, of the works. We take this premise to be the defendants' argument.

The premise does not apply in other areas of copyright infringement. There is no general requirement that most of each of two works be compared before a court can conclude that they are substantially similar. In the cases of literary works -- novels, movies, or plays, for example -- it is often impossible to speak of "most" of the work. The substantial similarity inquiry cannot be simply quantified in such instances. Instead, the court must make a qualitative, not quantitative judgment about the character of the work as a whole and the importance of the substantially similar portions of the work. *See, e.g., Harper & Row Publishers, Inc. v. Nation Enterprises*, ___ U.S. ___, ___ n.8, 105 S. Ct. 2218, 2233 - 34 & 2233 n.8 (1985); *Atari, Inc. v. North American Phillips Consumer Electric Corp.*, 672 F.2d 607, 618 (7th Cir.) ("When analyzing two works to determine whether they are substantially similar, courts should be careful not to lose sight of the forest for the trees."), *cert. denied*, 459 U.S. 880 (1982); *Hoehling v. Universal City Studios, Inc.*, 618 F.2d 972, 979-80 (2d Cir.) (warning against same danger), *cert. denied*, 449 U.S. 841 (1980). *See also Universal Pictures v. Harold Lloyd Corp.*, 162 F.2d 354 (9th Cir. 1947) (finding copyright violation for copying of 20% of plaintiff's film); *In re Personal Computers and Components Thereof*, 1983-84 Copyright L. Dec. (CCH) ¶ 25,651 at 18,931 (Int'l Trade Comm'n Mar. 9, 1984) (18% - 25% identity is sufficient for substantial similarity). *Compare Elsmere Music, Inc. v. National Broadcasting Co.*, 482 F. Supp. 741, 744 (S.D.N.Y.), *aff'd*, 623 F.2d 252 (2d Cir. 1980) (similarity

uncontested by defendants where four notes out of 100 measures and two words out of 45 were identical) *with Jewel Music Publishing Co. v. Leo Feist, Inc.*, 62 F. Supp. 596, 597 (S.D.N.Y 1945) (finding no substantial similarity where three bars of an eight-bar line were identical and the line appeared 24 times in both songs).

Computer programs are no different. Because all steps of a computer program are not of equal importance, the relevant inquiry cannot therefore be the purely mechanical one of whether most of the programs' steps are similar. Rather, because we are concerned with the overall similarities between the programs, we must ask whether the most significant steps of the programs are similar. *See Midway Mfg. Co. v. Strohon, supra*, 564 F. Supp. at 753. This is precisely what Dr. Moore did. He testified as follows:

> What I decided to do was to look at the programs that had the primary, or let's say most important, tasks of the system, and also ones which manipulate files, because there are a lot of programs that simply print lists, or answer a question when you ask him it, but I thought that the programs which actually showed the flow of information, through the system, would be the ones that would illustrate the system back.

App. at 704. Dr. Moore's testimony was thus in accord with general principles of copyright law. As we hold today that these principles apply as well to computer programs, we therefore reject the defendants' argument on this point.

D. *Sufficiency of the evidence* -- Defendants' final argument is that the district court erred in evaluating the testimony of Dr. Moore and Mr. Ness. They contend that, properly evaluated, Mr. Ness'

testimony was sufficiently strong and Dr. Moore's sufficiently weak, that there was not sufficient evidence of substantial similarity for plaintiff to prevail.

We have described the testimony of Dr. Moore and Mr. Ness, *see supra* 12-13; *see also infra* 59-63, and it is recounted in the district court opinion, *Whelan Associates v. Jaslow Dental Laboratory*, 609 F. Supp. at 1316. The district court explained its evaluation of the evidence as follows:

> I conclude . . . that Dr. Moore, plaintiffs' expert, had greater knowledge as to the particular programs at issue. Dr. Hess [*sic*], the defendants' expert witness, reviewed only the source and object codes of the IBM-Series 1 [Dentalab program], the IBM Datamaster [*see supra* n. 4], and the IBM-PC Dentcom system. He never observed the computer in operation nor viewed the various screens or the user's manual. He stated he was not familiar with EDL coding. More basically, however, his comparison as to dissimilarities was between the IBM Datamaster and the IBM-PC Dentcom systems. Plantiff contends that the IBM-PC Dentcom is a copy of the IBM Series 1 System -- not the IBM-Datamaster system. Dr. Hess's conclusions were that although the overall structures of those systems is similar, the code in the IBM-PC Dentcom is not "directly derived" from either plaintiff's IBM Series-1 or its IBM-Datamaster system. To the extent that Dr. Moore's testimony supports plaintiff's contentions of copying, I find his testmony more credible and helpful because of his detailed and thorough analysis of the many similarities.

Id. at 1321-22. Determinations of credibility and the relative weight to be given expert witnesses are, of course, left primarily to the discretion of the district court. Our review of the record convinces us that the district court's analysis of the two experts' opinions was far from being erroneous. As the district court pointed out, Mr. Ness had studied the programs, but he had never observed them at work in computers. *Id.* at 1321. The district court also pointed out that Mr. Ness was unfamiliar with EDL coding. *Id.* These factors suffice to support the court's conclusion.

In addition, we believe, on re-reading the trial transcript, that although Mr. Ness' testimony was quite competent, Dr. Moore's was persuasive on the issues relevant to this appeal. Whereas the greater part of Mr. Ness' testimony was concerned with the dissimilarities between the two programs' source and object codes, *see, e.g.*, App. at 824-32, Dr. Moore discussed the crucial issue in this case, the similarities and differences in the programs' *structures*. For example, when he discussed the programs' invoicing subroutine, Dr. Moore testified as follows:

* * *

> In the DentaLab system, the same kind of thing again, same information is up there, description, unit price, extension, items and program reads all those things in from te [*sic*] number of files actually, and displays them and then gives the operator a number of options to change the order as it appears on the screen to skip this one, to cancel it, or to accept it.
>
> The same choices are given in Dentalab systems, change, skip, cancel.

Assuming that the order is accepted, both systems then calculate the money, calculate the amount of money that will be billed, and at this point they use the price code to find which of the four prices are to be charged for this particular customer. Both systems do that. They pick that one of the four prices and calculate the total amount, write then the record of this invoice that has been formed to show the invoice's file, sets the flag in the order's file to show that this order has now been invoiced so that it doesn't get reinvoiced.

Q. What is a flag?

A. Well, a flag would be, in this case, a certain location is marked I for invoices, just an indicator that invoicing has been done on this record.

Q. Both used it?

A. Both used a flag. I don't remember whether Dentcom uses a letter I or some other symbol, but there is a flag there that it's a field number 12, in which it's indicated that this file has been invoiced or this order has been invoiced.

* * *

Q. Do you have any comment about the invoicing?

A. *Well, I think it should be clear, it was clear to me from going through these programs that there is a very marke[d] similarity between the two, that they, item by item, are doing pretty much the same thing with the same fields in the same files, and accomplishing roug[h]ly the same results.*

So there was quite a match, line by line, between these two, flow in these two.

Q. What do you conclude from that?

A. Well, back together with the file's structure, sort of set up with the -- how the programs have to proceed. I would think that the person who designed or constructed the DentaLab system must have been thoroughly familiar with the Dentcom system.

The person who constructed the Dentcom system must have been familiar with the series one system, because the same file structure and same program steps are followed, same overall flow takes place in both systems.

App. at 710-12 (emphasis added). Dr. Moore's testimony about Dentcom's and Dentalab's month-end subroutines also demonstrates the structural comparisons in which he engaged:

Q. What did you find in month-end?

A. Okay. Month-end, the calling program in Dentcom, this obviously is done at the end of each month.

In the Dentcom system there is a program called MOEND, which chains all these other programs, that is, MOEND calls MOPRDL, and after that program runs, goes back to MEEND, calls the print sale and so on.

In the Dentalab system there is a supervisory program also called MOEND, and that system calls or runs a series of programs doing various functions.

Now *if we look at the functions done by the programs in order, we find that they are*

the same except for a flipping of the order in the first two things.

The Dentcom system, it first prints product group report, and then prints the monthly customer sales analysis.

In Dentalab, just reverses, prints sales analysis first, product group report second.

After that, both systems do the same thing in the same order.

They now do accounts receivable aging, since a month has gone by they have to update all the 30 days, 60 days, et cetera, calculate service charges. Then they print the monthly AR reports that had to do with service charges, only those that involve service charges, they both do that. Then they both print the age file balance, balance report, and following that they print the month and accounts receivable report. That's the total accounts receivable rport [*sic*].

Then they both go through and look for accounts that are not active that month, and print a list of these accounts, accounts not serviced, an account that doesn't have any access.

The final think that the Dentcom system does is to calculate the new AR total for the entire lab, which I mentioned is contained in the company file.

DentaLab doesn't keep that total, so that's the last item, that is not as far as I can tell, done by DentaLab. I may have said -- did I say Dentcom keeps that total? DentaLab does not. That's the only difference.

App. at 716-18 (emphasis added). Dr. Moore testified in similar detail and to similar effect about the other three subroutines that he felt were particularly important, order entry, account receivable, and day's end.[46] This testimony, in addition to Dr. Moore's exhaustive comparison of the two programs' file structures, *see supra* 12, and his testimony about the screen outputs, *id.*, demonstrates the marked similarity between the programs. Defendants' argument as to sufficiency of the evidence therefore fails.[47]

VII. *CONCLUSION*

We hold that (1) copyright protection of computer programs may extend beyond the programs' literal code to their structure, sequence, and organization, and (2) the district court's finding of substantial similarity between the Dentalab and Dentcom programs was not clearly erroneous. The judgment of the district court will therefore be affirmed.

---

46. Dr. Moore's notes comparing the two programs' modules were introduced as exhibits. His comparison of the order entry modules is characteristic of his comparisons of the other modules and is reprinted in Appendix A to this opinion. As we have suggested, this evidence is probative, not dispositive, of copyright infringements.

47. Of course structural similarities between two programs can also arise in completely legitimate ways -- *e.g.*, where the authors of the two programs have included subroutines from common, unprotected subroutine libraries, or where the authors of both programs have consulted common, public domain, reference books. There can be no bright line rule as to when similarities are evidence of infringement and when they are legitimate -- that is a determination to be made by the trier of fact. *See supra* note 23. There is no suggestion in the present case that the similarities between Dentalab and Dentcom were the result of such common ground, however, and so the court's inference of copyright infringement from its finding of substantial similarity was correct.

APPENDIX A

ORDER ENTRY PROGRAMS

Dentcom PC Systems	*Dentalab System*
Primary Menu. choose [1] Production MENU	Primary Menu. choose [1] Production SCHEDULING
Production menu choose [1] ORDER ENTRY ORDER ENTRY program	Production Menu. choose [1] ORDER ENTRY DL1000 program (Order entry)
"ENTER ACCOUNT NAME KEY:	"ENTER ACCOUNT OR NAMEKEY"
Check CUSTMAST for valid customer. If valid. read CUSTMAST file for this customer.	"Check CUSTMAST for valid customer. Read CUSTMAST file on this customer.
If yes. increment order # in ORDERS	Increment sequential order no. in ORDERS. Display customer name. address.
Display entry screen. patient shade. mould. remake. call Dr.? Dr.?	Display entry screen (6.6). patient shade. remake. call
case/pan #. Drs. request date. final case status T. F. B. R.	Pan #. Dr's. request date.
IS THIS SCREEN CORRECT?	
If yes ask for first department number. Display dept. order screen (P10) (list of item in this dept from ITEMMAST)	As for first department number. Display dept. order screen (6.8 -6.11) (list of items in this dept. from ITEMMAST)
User entry choices	User entry choices
System adds days in dept. from COMPANY to present date to find due out date. Time is of AM. "Noon" or PM. System accumulates case load by product of item load factor x quantity	System adds days in dept. [DAYVAL] to present date to find due out date. System computes workload for dept/day out by product of load factor x quantity.
ITEMMAST	ITEMMAST
Adds this to load already in DEPTLOAD for date out.	Add this to load already in DAYVAL for date out.

A True Copy:

Teste:

Clerk of the United States Court of Appeals
for the Third Circuit

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF PENNSYLVANIA

WHELAN ASSOCIATES, INC.	:	CIVIL ACTION
	:	
v.	:	
	:	
JASLOW DENTAL LABORATORY, INC., ET AL.	:	NO. 83-4583

OPINION AND ORDER

VANARTSDALEN, J. **JANUARY 22, 1985**

A. FINDINGS OF FACT

1. Whelan Associates, Inc. (Whelan Associates) is a Pennsylvania corporation, incorporated and organized in 1979 by Elaine P. Whelan, who is the president and a director and controlling stockholder of Whelan Associates. The main business of Whelan Associates is designing and marketing custom computer applications. Insofar as relevant to this case, Whelan Associates is in the business of designing and marketing computer software programs for use in the business operations of dental laboratories.

2. Whelan Associates claims that it is the sole and exclusive owner of a computer software program which it has named the Dentalab System. The Dentalab System was designed for the IBM-Series 1 Computer and written in EDL computer language. It was later written for the IBM-Datamaster Computer in BASIC computer language. For all practical purposes the Datamaster Dentalab System is no longer being marketed due to lack of interest by the dental laboratory industry with utilizing the IBM-Datamaster computer. Whelan Associates has more recently developed a Dentalab system for use with the IBM-PC Computer, a smaller, more inexpensive personal computer, suitable for use with dental laboratories employing 25 or fewer employees. Whelan Associates claims ownership to registered copyrights to the Dentalab Computer programs and a related Installation Guide and a User Manual.

3. Plaintiff claims that the defendants have wilfully infringed upon plaintiff's copyrights, engaged in unfair competition and tortiously interfered with existing and prospective contractual relations. Plaintiff claims that defendants have wrongfully marketed the Dentalab System for the IBM-Series 1 Computer including marketing of maintenance agreements for previously sold systems. Plaintiff further claims that defendants wrongfully developed and are marketing an infringing software system for use with an IBM-PC Computer under the trade name Dentlab.

4. Elaine Whelan is an experienced computer programmer, analyst and systems designer. In 1978 she was owner of one-half of the corporate stock of Strohl Systems Group, Inc. (Strohl Systems). Myles Strohl was the owner of the other half of the stock. Strohl Systems, at that time, was in the business of designing custom computer software programs.

5. Jaslow Dental Laboratory, Inc. (Jaslow Laboratory) was in the business of operating a successful dental laboratory. Edward Jaslow, the father of Rand Jaslow, was the president. Rand Jaslow was an officer and stockholder of Jaslow Laboratory. During 1978, Rand Jaslow attempted to develop a computer program for various business operations of Jaslow Laboratory such as registering receipt of orders; processing orders; maintaining inventory, cost controls, and customer lists; performing invoicing, billing and accounting functions; and performing other related functions and services. Rand Jaslow had no experience or formal training in computers or in computer programming and systems design. He had purchased from Radio Shack a small, relatively inexpensive computer, a TRS-80, that had no printer and limited capacity. Rand Jaslow was unsuccessful in developing a computer program that would be useful in the operation of Jaslow Laboratory.

6. Rand Jaslow eventually had communications with Strohl Systems concerning Strohl Systems creating a workable computer system for Jaslow Laboratory. By letter dated August 31, 1978 (Exhibit J-1) Strohl Systems submitted a written proposal to Jaslow Laboratory to design and implement a computer software system for Jaslow Laboratory. The proposal outlined the general

scope of the functions to be included in the design, the methods by which the design would be developed (including a description of the work to be done, such as preparation and delivery of the system together with instructions), a time schedule for completion, and the charges to be made for the services. Strohl Systems was to receive a fee of $18,000 to design the system plus certain expenses. The system was to be designed for use with an IBM-Series 1 computer which Jaslow Laboratory was to acquire, either by lease or purchase at its own expense. Elaine Whelan was designated in the proposal as the person who would "lead the Strohl Systems team."

7. The proposal of August 31, 1978 was supplemented by a letter dated September 30, 1978 from Strohl Systems to Jaslow Laboratory (Exhibit J-2). The letter stated as follows:

> This communication is a supplement to our proposal letter dated 8/31/78.
>
> We propose that all software developed by us for your dental laboratory system remain under our ownership. This basic system can then be marketed to similar laboratories by our organization. A royalty of ten percent of the basic package price would be returned to Jaslow Dental Laboratory for each system sold. Modifications to the system would be sold separately with all proceeds to our organization.
>
> If the above points of agreement are acceptable, would you please sign and return the enclosed copy.

8. The proposal as set forth in the letters of August 31 and September 30, 1978 was accepted by Jaslow Laboratory, although never acknowledged in writing. Pursuant to the agreement, Strohl Systems designed and installed a software computer system for use by Jaslow Laboratory on the IBM-Series 1 Computer. The system was installed and placed in operation in Jaslow Laboratory's place of business.

9. At all times, the designing of the computer system, was under the direct supervision and control of Elaine Whelan, and it was she who actually designed the system. In performing this

task, she conferred extensively with Rand Jaslow as to the operation of the business of Jaslow Laboratory. In the process she learned the methods used by Jaslow Laboratory in receiving, processing and delivering orders, invoicing, billing, controlling inventory, accounting and, in substance, the detailed manner in which Jaslow Laboratory conducted its business, other than the actual manufacturing processes used in filling orders. She also conferred with Rand Jaslow and other employees of Jaslow Laboratory as to features, capabilities and functions of the computer that would be desirable and useful in operating the business. In addition, she did a substantial amount of independent study and research as to the methods of operation of other dental laboratories in order to design a system that would be readily adaptable to other laboratories.

10. The computer program designed and originally developed for Jaslow Laboratory was written in Event Driven Language (EDL), a recognized form of computer language. Computer language is the method used to write the source code for a computer program. In designing this program, both Strohl Systems and Jaslow Laboratory intended and understood from the outset that the system would be designed so that it could be readily used and adapted by a skilled computer programmer for dental laboratories throughout the industry. It was contemplated that after developing a satisfactory system, Strohl Systems would market the system to other dental laboratories. Both Strohl Systems and Jaslow Laboratory knew that the operation of dental laboratories was substantially the same throughout the industry and that it would be quite feasible to adapt the system that would be developed for Jaslow Laboratory to many other dental laboratories.

11. The agreement (Exhibit J-2) expressly provided that "all software developed" by Strohl Systems for Jaslow Laboratory was to "remain under our [Strohl Systems'] ownership", and the "basic system" was then to be marketed by Strohl Systems. Jaslow Laboratory was the pilot program. Jaslow Laboratory agreed to make its computer available for demonstration purposes. As compensation for such demonstrations and for the information provided as to the operation of dental laboratories,

Jaslow Laboratory was to receive a commission of 10% of the basic package price of any additional systems sold to other dental laboratories. Modifications to the basic system as originally developed for Jaslow Laboratory were to be sold separately by Strohl Systems and Jaslow Laboratory was to receive no part of the proceeds from such sales. (Exhibit J-2)

12. The system became operational for Jaslow Laboratory around March, 1979. As Rand Jaslow and other personnel of Jaslow Laboratory became familiar with the operation, modifications and enhancements were suggested and requested. Strohl Systems, through Elaine Whalen, made various enhancements and modifications between March and October, 1979. Strohl Systems, through Elaine Whelan, for these changes, and Jaslow Laboratory paid such charges.

13. In 1979, Strohl Systems commenced marketing the system it had developed. In so doing, it used the trade name of "Dentalab". The name was not registered as a trade name or trademark.

14. An agreement dated November 15, 1979 between Myles Strohl and Elaine Whelan and Strohl Systems separated the interests of Myles Strohl and Elaine Whelan in Strohl Systems. Under the agreement (Exhibit J-25), Elaine Whelan sold her entire interest in Strohl Systems. In return, she was granted permission to market the dental laboratory computer program under the name Dentalab. Myles Strohl and Strohl Systems agreed that they would refrain from engaging in any way in marketing computer programs for dental laboratories for a period of two years.

15. An agreement dated August 19, 1983 between Myles Strohl and Elaine Whelan and Strohl Systems (Exhibit J-26) supplemented the agreement of November 15, 1979 between the parties. The preamble of the August 17, 1983 agreement provides:

> A. The parties previously entered into a written Agreement dated November 15, 1979, which Agreement is hereby incorporated by reference as if set forth *in extenso*.

B. In said Agreement [Elaine P.] Whelan received the ownership (source code, etc.) of a certain computer software program for use by dental laboratories, which program was designed and made by Whelan during her period of service for SSG [Strohl Systems]. Under the Agreement, SSG and [Myles L.] Strohl were given the non-exclusive right to market the said computer software program beginning November 15, 1981.

C. SSG and Strohl have made no marketing effort relating to this program; have not assigned such marketing rights to anyone; and now desire to surrender and terminate such marketing rights.

D. It is the purpose of this writing formally to carry out the intentions of the parties.

By the terms of the Agreement Strohl Systems and Myles L. Strohl surrendered and terminated all of their marketing rights under the Agreement of November 15, 1979 and all marketing rights to the computer software program for dental laboratories. The Agreement contained mutual releases. Elaine Whelan paid $2,500 in full consideration for the Agreement. She thus acquired all remaining rights of Strohl Systems to the computer program.

16. A separate agreement between the same parties also dated August 19, 1983 assigned, granted and sold to Elaine Whelan all of the right, title and interest of Myles L. Strohl and Strohl Systems in and to the computer software programs known as the "Dentalab Package," which expressly included all related technical sales and operating manuals, advertising materials, program source codes, flow charts and related material as well as all copyright entitlements and claims of past copyright infringements. The assignment recited that Elaine Whelan had "designed and developed a series of computer software programs known as a Dentalab Package." (Exhibit J-27).

17. Elaine Whelan formed Whelan Associates, Inc. (Whelan Associates) in November, 1979, as a corporation to market the dental laboratory software computer program under the

trade name of Dentalab. All of the right, title and interest that she had in "Dentalab" was assigned to Whelan Associates, but no writing acknowledging such assignment was made until a writing dated September 27, 1983, which asserted it was effective as of November 30, 1979, "nunc pro tunc." That writing (Exhibit P-65) constituted an assignment of copyrights including the right to sue for past infringements.

18. Whelan Associates filed four copyright registrations for the dental laboratory software computer program, including enhancements and an installation guide and a user's manual.

1. Exhibit P-103: Registration TXU-131-586
   Effective Date: 8/16/83
   Title of Work: DENTAL LAB FOR IBM SERIES 1
   Nature: Author of entire computer program text.

2. Exhibit P-104: Registration TXU-139-595
   Effective Date: 11/7/83
   Title of Work: DENTAL LAB FOR IBM SERIES 1
   Nature: Computer program text.

3. Exhibit P-105: Registration TXU-139-614
   Effective Date: 10/24/83
   Title of Work: DENTAL LAB INSTALLATION GUIDE

   Nature: Manual for implementation and installation of computerized system for Dental Laboratory operations.

4. Exhibit P-106: Registraton TXU-139-616
   Effective Date: 10/24/83
   Title of Work: DENTALAB IBM SERIES I USERS MANUAL

Nature: Manual for use of computer program.

The registration TXU-139-595 (Exhibit P-104), filed November 7, 1983, was the source code for the original program. The named author was Strohl Systems. The claimant was Whelan Associates by reason of the agreements and writing set forth in findings of fact numbers 14, 15 and 16. (Exhibits J-25, J-26, J-27,

P-65). Registration TXU-131-586 (Exhibit P-103) was the source code for the additions and enhancements to the program developed by Whelan Associates.

19. A written agreement dated July 30, 1980 concerning the sale and marketing of the Dentalab Package to other dental laboratories was executed between Whelan Associates and Jaslow Laboratory (Exhibit J-11). The agreement acknowledged the practical fact that Jaslow Laboratory had superior contacts and marketing and sales ability within the dental laboratory industry, and Whelan Associates had the necessary expertise and capability to develop, enhance, adopt, modify, program, install and maintain the Dentalab software program for other dental laboratories. The Agreement of July 30, 1983 was intended to establish a working relationship between Jaslow Laboratory and Whelan Associates. The preamble provided inter alia, as follows:

> 1. Edward Jaslow and Rand Jaslow are the principal officers and stockholders of Jaslow Laboratory.
>
> 2. Elaine Whelan is a recognized expert in designing and developing computer programs.
>
> 3. Jaslow Laboratory is using an effective computer program described as the "Dentalab Package," which Jaslow Laboratory owns and "which was designed and developed" by Elaine [Whelan] with the aid and assistance of Edward Jaslow and Rand Jaslow.
>
> 4. Both Jaslow Laboratory and Whelan Associates have the right to sell or license the Dentalab Package, together with the necessary component parts, software and accessories.
>
> 5. Strohl Systems also would have the right to sell or license the Dentalab package after November 15, 1981, pursuant to the Agreement of November 15, 1979. (Exhibit J-25. See finding of fact number 13).

20. The substantive provisions of the Agreement of July 30, 1980 (Exhibit J-11) provided, in part:

a. Jaslow Laboratory, for a period of one year would be "sales representative" of Whelan Associates "to market, sell or lease the Dentalab Package," together with related components, software and accessories as then existing or thereafter improved or modified.

b. Whelan Associates at its own expense was to improve and augment "the previously successfully designed Dentalab Package."

c. The parties were to cooperate in setting prices, terms and conditions of sale, but the decision of Whelan Associates was to be final and determinative on all such matters, but such determinations could not be "unreasonble."

d. All marketing was to be conducted in the name of Whelan Associates and sales and leases and service arrangements were also to be in the name of Whelan Associates. Final acceptance of all agreements on behalf of Whelan Associates was the responsibility of Elaine Whelan, subject to acceptance not being "unreasonably" refused.

e. After one year, either party could terminate the agreement upon 30 days written notice. Upon termination, Jaslow Laboratory was to return all property of Whelan Associates "including but not restricted to component parts, software, accessories, books, records, papers, leases, agreements with purchasers, sales or promotion literature, etc." Whelan Associates was to return all property of Jaslow Laboratory to Jaslow Laboratory upon termination.

f. Jaslow Laboratory, acting through Edward and Rand Jaslow was to use its best efforts in marketing the Dentalab Package. Jaslow Laboratory was to receive 35% of the gross price of any original package sold plus 5% of any "modification and/or program sold and delivered."

g. Jaslow Laboratory was to pay all of its own expenses including overhead and promotions.

21. By letter dated June 22, 1982, Rand Jaslow, on behalf of Jaslow Laboratory gave Whelan Associates 30 days notice that it did not intend to "renew" the Agreement of July 30, 1980 and suggested that the parties attempt to renegotiate the terms of the Agreement. Basically, Jaslow Laboratory wanted a larger commission on sales, particularly as to enhancement and additions sold a customer after the sale of the basic package. Jaslow Laboratory also claimed that it should receive compensation for work and services it asserted it rendered to customers in supporting a system after it was installed. Despite the letter of June 22, 1982, the parties continued to work in accordance with the Agreement of July 30, 1980 and they did not negotiate any different agreement.

22. By letter dated January 31, 1983 from counsel, Jaslow Laboratory purported to terminate "immediately any relationship" between Whelan Associates and Jaslow Laboratory. In the letter, Jaslow Laboratory asserted that Jaslow Laboratory would thereafter be the exclusive marketer of the Dentalab Package. The letter further demanded return of "all materials related to the Dentalab Package including source and object codes and other pertinent documents." The letter further contended that the Dentalab Package contained valuable Jaslow Laboratory trade secrets that were not to be disclosed. The main contention in the letter from counsel was that Jaslow Laboratory was the sole and absolute owner of the Dentalab System and that Whelan Associates had no rights whatsoever in the system and no right to either market the system or continue to maintain and service systems that were already installed. (Exhibit P-36).

22. Whelan Associates hired Joseph Cerra as vice president of marketing. He worked in close association with Rand Jaslow in selling the Dentalab system to other dental laboratories. In June, 1983, he resigned, after assuring Elaine Whelan that he was not going to become associated with Rand Jaslow. There was no written agreement between Whelan Associates and Joseph Cerra that he would refrain from competing if and when he left the employ of Whelan Associates.

23. On or about August 1, 1983, Dentcom, Inc. (Dentcom) was formed and organized as a corporation by Rand Jaslow,

Edward Jaslow, Joseph Cerra and Paul Mohr as the sole shareholders. The purpose of Dentcom was to market computer software programs including the Dentalab Package to the dental laboratory industry.

24. From July 30, 1980 to May 31, 1983, sixteen Dentalab Systems for IBM-Series 1 computers were sold and delivered by granting licenses to the purchasers. The licenses were issued in the name of Whelan Associates. The computers, owned or leased by the licensees, were programmed and the software installed by employees of Whelan Associates, utilizing the source and object codes and the system as designed and developed by Elaine Whelan.

25. After Elaine Whelan developed the Dentalab System for use with the IBM-Series 1 computer, Whelan Associates, under the supervision of Elaine Whelan, developed essentially the same computer program for use in the IBM-Datamaster 26 Computer, a later model computer. The Source Code for the IBM-Series 1 was written in EDL language. The source code for the IBM-Datamaster 26 was written in BASIC language and, in substance, the program was re-written from the IBM-Series 1 program. The Datamaster 26 computer proved not to be commercially attractive, at least to dental laboratories, and therefore the Dentalab System for the Datamaster is, from a practical standpoint, essentially obsolete. Although Whelan Associates continued to market the Datamaster program, Whelan Associates has also developed a Dentalab System for the IBM-PC Computer. The IBM-PC Computer is a smaller and less expensive computer than the IBM-Series 1 computer. The program as developed by Whelan Associates will perform most of the functions that the Dentalab System for the IBM-Series 1 computer was designed to do. The parties to this litigation expect that the software for the IBM-PC computer will be commercially the most successful.

26. Commencing sometime around May or June of 1982, Rand Jaslow attempted to prepare, on his own, a computer software program for dental laboratories that could be installed on an IBM-PC computer. In doing this, he was able to utilize all of the knowledge he had gained as to the operation of the Dentalab

System. He attempted to write a source code in BASIC computer language. He attempted to adopt in almost exact duplication all of the functions, the format of the screens, the language and abbreviations, methods of collating, the file structure and work flow that had been designed into the Dentalab System for the IBM-Series 1 computer.

27. At all times the source codes for the Dentalab System for the IBM-Series 1 computer together with all improvements and enhancements was to be kept in the exclusive possession of Strohl Systems and after November 15, 1979, Whelan Associates and its experts including Elaine Whelan and the Whelan Associates programmers. At no time was Rand Jaslow ever authorized to have a copy of the source codes by either Strohl Systems or Whelan Associates. The source codes were developed exclusively by Strohl Systems, and later enhancements by Whelan Associates and Elaine Whelan. Nevertheless, Rand Jaslow, during the period of time that he was attempting to write a program for the IBM-PC computer, surreptitiously and without consent of either Strohl Systems or Whelan Associates obtained a copy of the source code which he utilized in trying to develop a program for the IBM-PC computer.

28. Rand Jaslow was unsuccessful in his attempt to develop a program for the IBM-PC computer that would be a usable, functional program. In August, 1983, at or about the time of the formation of Dentcom, Jaslow Laboratory and Rand Jaslow employed an expert computer programmer, Jonathan Novak, to assist in developing a program for the IBM-PC computer. Jonathan Novak proceeded to utilize the work done by Rand Jaslow, which Mr. Novak found to be the work of a talented but unskilled amateur, containing many errors, and showing a lack of expertise in computer programming and designing. Mr. Novak succeeded in developing a workable program for use with the IBM-PC computer.

29. About the time that Dentcom was formed, it started to advertise and aggressively sought to market the Dentalab System for the IBM-Series 1 computers under both the name of Dentalab and a newly adopted name of Dentlab. Upon Mr.

Novak developing a usable program, Dentcom and Jaslow Laboratory sought to market the IBM-PC system under the name of both Dentalab and Dentlab. Further, Dentcom and Jaslow Laboratory sought to obtain and to take over the service and maintenance agreements that Whelan Associates had entered into with various purchasers of the Dentalab System that had been marketed under Whelan Associates' name and installed by Whelan Associates.

30. The name Dentlab was used for the purpose of misleading the dental laboratory industry and prospective customers into thinking that the Dentcom system was the same as Dentalab. Some potential customers, as well as customers who had service maintenance agreements, were confused and misled by the name Dentlab as advertised by Jaslow Laboratory and Dentcom.

31. Jaslow Laboratory, subsequent to May 31, 1983, advertised and marketed the IMB-Series 1 Computer system under the name of Dentalab and Dentlab. It sold at least two IBM-Series 1 systems. One was sold to Cooper Laboratories of Baltimore, Maryland. The other was sold to Myron Laboratory of Kansas City, Kansas. Both laboratories had been actively solicited as strong prospects by both Rand Jaslow and Joseph Cerra prior to May 31, 1983. The system was obtained by direct copying of the system then in use by Jaslow Laboratory. The sales were finalized and the systems installed after a hearing held on November 3, 1983 on an application by Jaslow Laboratory for a preliminary injunction, which application was denied. At that hearing Jaslow Laboratory as well as Rand Jaslow and Edward Jaslow advised the Court through counsel that they had no interest in marketing IBM-Series 1 programs.

32. The sale price of each of the two licenses sold by Jaslow Laboratory was $22,000. Jaslow Laboratory had direct installation costs of $654.54 on the Cooper Laboratories sale and $1,246.23 on the Myron Laboratory sale. Thus, the gross profits from the sale of the two systems was $42,099.23.

33. As of May, 1983, on accounts due between Whelan Associates and Jaslow Laboratory, Whelan Associates owed Jaslow Laboratory $16,829 on the basis of their agreements existing to

that date. Whelan does not dispute this amount in any way, except to contend that Jaslow Laboratory is not entitled to recover anything on any contractual claims because of its breach of fiduciary duties to deal in good faith with Whelan Associates.

34. Dentcom has sold 23 licenses for the IBM-PC Dentcom system under the name Dentlab. The gross sales price, including sales of computer hardware, is $212,060. The sales price of the hardware was $110,791, leaving a gross sales profit on the sale of the licenses of $101,269.

35. There are many similarities between the IBM-PC program presently being marketed and sold by Dentcom and the IBM-Series 1 software program designed and developed by Elaine Whelan. The source codes for the two systems are in different computer languages. No direct translation from the EDL language to the BASIC language was made by Rand Jaslow or Jonathan Novak. The IBM-Series 1 Dentalab System can be directly copied even where there is no literal translation. Attempting to translate literally the source and object codes from the EDL language to the BASIC language would be an inefficient method of copying the computer system program. Knowledge and use of the source code in order to make the conversion from EDL to BASIC is very helpful.

36. Dr. Moore testified as a computer expert on behalf of plaintiff. He testified to the many similarities between the IBM-Series 1 system and the IBM-PC Dentcom system. His concluding opinion was that the person who wrote the Dentcom PC program "had a thorough knowledge of the Series 1 system, and he used that knowledge to design the Dentcom system, whether it was a case of reading the Series 1 program and copy [sic] it over, of course, I don't know." (Notes of testimony, July 10, 1984, page 7). Dr. Moore also stated that although he could not say whether the person preparing the IBM-PC program had the IBM-Series 1 source code "alongside of him when he wrote the other one" that "[s]ometime in the past he must have had access to source code to be able to understand the system and to be able to use all those same sequential operations," and that he "either worked from the source code or had a thorough knowledge of the Series 1 system."

37. Stephen A. Hess testified as an expert on behalf of the defendants. In substance, he testified to the many differences and dissimilarities between the IBM-Datamaster 26 system written in BASIC and the IBM-PC Dentcom system. He concluded that the IBM-PC Dentcom system was "not directly derived from either the Series 1 or the Datamaster system." His study and research was primarily a study of the source codes, and he did not examine the actual operation of any of the systems in dispute.

B. DISCUSSION

Plaintiff and defendants both claim exclusive proprietary rights to a computer software system developed as a complete computer business management and control program for the operation of dental laboratories. The original system was designed and programmed for use with an IBM-Series 1 computer. The source code was written in EDL computer language. Thereafter the program was re-written in BASIC computer language for use on the IBM-Datamaster 26 computer. Plaintiff filed copyright registrations for the IBM-Series 1 computer system, including additions and enhancements and manuals.

Defendants claim that they, through Rand Jaslow, co-authored with Elaine Whelan the original program. In addition, defendants claim that the original program and its enhancements for use with the IBM-Series 1 computer was written and designed exclusively for Jaslow Laboratory, and as such the defendants are the sole owners of the entire program, including the source and object codes. Defendants therefore contend that the copyrights registered in the name of Whelan Associates are invalid. Defendants further contend as to the IBM-PC Dentcom system that: (a) since they are the owners of the IBM-Series 1 system they had the right to copy or use that system in any way they saw fit to develop the IBM-PC system, or alternatively (b) as co-author and co-owners they had such a right, and finally (c) the IBM-PC system was developed independently from the IBM-Series 1 system and is not a copy and therefore does not constitute infringement of any copyrights, even if the copyrights are valid. Defendants further contend that the use by them of the name Dentlab is not an infringement of any trade name rights

asserted by plaintiff to the name Dentalab. Defendants claim "Dentalab" is a generic descriptive name not subject to trade name protection.

The disputes between the parties have several distinct categories. First are those concerning the rights and liabilities arising out of the development and marketing of the IBM-Series 1 program. Apparently, both plaintiff and the defendants agree that this category is relatively minor because it is not anticipated that there will be extensive future sales of this system due largely to obsolescence of the IBM-Series 1 computer or at least its lack of acceptability by dental laboratories. Defendants have repeatedly stated through counsel that they have no interest in the marketing of IBM-Series 1 software; nevertheless they did finalize two sales subsequent to the hearing on the application for a preliminary injunction. If those sales violated plaintiff's rights, plaintiff is entitled to damages for such sales as well as possible injunctive relief as to future sales.

The second and most substantial dispute involves the rights and liabilities arising out of defendants, through Dentcom and Rand Jaslow, developing and marketing the software system for the IBM-PC computer. If this was a copy of the IBM-Series 1 software system, and if plaintiff had exclusive rights to that system and the copyrights are valid, then defendants would be liable for infringement and subject to being enjoined from future marketing of the system. All parties agree that the potential for future sales and profits for the software systems that have been developed by the parties for use by dental laboratories rests almost exclusively with the IBM-PC computer programs.

Finally, there are disputes between the parties arising out of claims of unfair and deceptive business practices including the use of the name of Dentlab by Dentcom. Again, counsel for defendants has asserted that this name has not been used by any of the defendants since the hearing on the application for a preliminary injunction. Nevertheless, defendants contend their use of the name Dentlab was and remains proper, and that the name Dentalab is a generic, descriptive word—not a protectable trade name.

A three day hearing on an application by defendant for a preliminary injunction concluded on November 2, 1983. I declined to grant any preliminary injunctive relief. After extensive but fruitless settlement negotiations, discovery was concluded and the case was brought to trial. Pursuant to Federal Rule of Civil Procedure 65(a)(2), the evidence presented at the preliminary injunction hearing was made a part of the trial record and evidence.

At the conclusion of the preliminary injunction hearing I stated, from the bench, certain findings of fact and conclusions of law which I made based on the record as it then stood. (See hearing of November 2, 1983, "third day," pages 3.192 through 3.206 inclusive). Upon the whole record I now reaffirm those findings and conclusions, and they shall be deemed a part of this decision. Among those findings and conclusions were, in substance, the following:

1. Strohl Systems initially designed and developed the software computer system and programs for the IBM-Series 1 computer. Elaine Whelan, the person instrumental in the design of the system later acquired all of the interest of Strohl Systems in the software system, and she, in turn, transferred all of her interest to the plaintiff, Whelan Associates.

2. From the outset it was understood and agreed between Strohl Systems and Jaslow Laboratory and its officers, agents and employees that the computer system to be designed and placed in operation and used by Jaslow Laboratory would be made adaptable, available, sold and marketed to other dental laboratories including competitors of Jaslow Laboratory, and that Jaslow Laboratory would be involved in the marketing and selling of such computer systems to other dental laboratories.

3. Strohl Systems and Jaslow Laboratory worked together under an agreement (Exhibit J-2) for selling computer systems to dental laboratories that expressly provided that all software developed by Strohl Systems for Jaslow

Laboratory would remain under the ownership of Strohl Systems and that Strohl Systems could market the system to other dental laboratories and that Jaslow Laboratory would receive 10% of the basic package price for each system sold, but modifications to any system would be sold separately and all proceeds from such sales were to go to Strohl Systems. This agreement was subsequently modified between Whelan Associates and Jaslow Laboratory by agreement of July 30, 1980, whereby Jaslow would receive 35% of the gross price of any program sold plus 5% of any modifications. (Exhibit J-11).

4. The agreement between Whelan Associates and Jaslow Laboratory dated July 30, 1980 (Exhibit J-11) acknowledged that Jaslow Laboratory owned its own specialized system that had been programmed for it on its IBM-Series 1 computer. I concluded, however, that Jaslow Laboratory did not own or hold a proprietary interest in the computer software system or its source or object codes that had been designed and developed by Elaine Whelan for use by other dental laboratories throughout the industry.

5. The agreement of July 30, 1980 required Jaslow Laboratory, upon termination of the agreements, to turn over to Whelan Associates all of the software system, which would include the source and object codes if Jaslow Laboratory had possession of any copy of them, and that all rights to market the system would revert to Whelan Associates.

6. Jaslow Laboratory revealed no trade secrets to Whelan Associates and/or Strohl Systems under any claim of confidentiality, and no trade secret of Jaslow Laboratory was in any way incorporated into or disclosed by the computer system developed and marketed by Whelan Associates to other dental laboratories.

One of the defendants' principal contentions is that Rand Jaslow was a co-author and owner of the Dentalab System both as originally designed and with all of its improvements and enhancements. From this defendants contend: (a) the copyrights

registered by Whelan Associates are invalid for not disclosing Rand Jaslow's co-ownership (b) Jaslow Laboratories had and continues to have at least a co-equal right with Whelan Associates to market, sell and service Dentalab Systems for the IBM-Series 1, IBM-Datamaster, and IBM-PC computers, (c) Jaslow Laboratories is entitled to possess, utilize, copy and sell all source and object codes that were developed by Elaine Whelan and all other information derived from the designing and development of the system.

Rand Jaslow's claim of co-authorship stems from his claim that he originated the concept of developing an overall computer program that could accommodate the business needs of a dental laboratory, that he disclosed to Elaine Whelan in detail the operation and methods of Jaslow Laboratory in conducting its business, that he explained to Elaine Whelan the functions to be performed by the computer and helped design the language and format of some of the screens that would appear on the computer's visual displays. In addition, Rand Jaslow claims that he had gained on his own, extensive knowledge and understanding of computers by practicing on a small mini-computer, and therefore gave valuable assistance to Elaine Whelan.

I have concluded and found from all of the evidence that it was Elaine Whelan and her own staff at Strohl Systems who alone designed the system. She alone was the author. It was her expertise and creativeness that designed the methods by which the raw information would be stored, held in memory, collated, assembled, updated, incorporated and added to the visual screens or included in print-outs, subject to recall. She designed the flow of the system, establishing communication and coordination among the various functions, and in general, made the system operate as a successful and useful business tool. Although there may have been others who could have designed an equally satisfactory system, given the information provided by Rand Jaslow, it was nevertheless Strohl Systems through Elaine Whelan alone that was the author of the source and object codes and the designer of the system.

Rand Jaslow did little more than explain the operations of the dental laboratory business and define the information he

wanted to be able to obtain from the computer. The information and advice which Rand Jaslow provided was little more than one would expect from the operator of any business who seeks to have a computer system designed for him. Such general assistance and contributions to the fund of knowledge of the author did not make Rand Jaslow a creator of any original work, nor even the co-author. It is similar to an owner explaining to an architect the type and functions of a building the architect is to design for the owner. The architectural drawings are not co-authored by the owner, no matter how detailed the ideas and limitations expressed by the owner. *See Aitken, Hazen, Hoffman, Miller, P.C. v. Empire Construction Co.*, 542 F.Supp. 252 (D.Neb.1982).

In 17 U.S.C. §101 the definition of a "joint work" is a "work prepared by two or more authors with the intention that their contributions be merged into inseparable or interdependent parts of a unitary work." There is not a scintilla of evidence that the parties ever intended that Rand Jaslow's contributions, whatever they may have been, should merge into the final computer design and system. The only suggested merger into the whole might be the wording and the abbreviations contained on some of the visual screens. His contributions were not of sufficient significance to constitute him a co-author of the system. *Compare Meltzer v. Zoller*, 520 F.Supp. 847 (D.N.J.1981).

The defendants also contend that they are entitled to the protection of the copyright laws under the "works for hire" doctrine. 17 U.S.C. §101, 201(b). Elaine Whelan was the author, she created not only the source and object codes, but the embodiment of the whole system as to the methods by which the computer would perform its functions. Clearly, she was the employee of Strohl Systems which, in turn, was engaged as an independent contractor by Jaslow Laboratory. Elaine Whelan was never an employee of Jaslow Laboratory. Under the 1976 Copyright Act the works for hire doctrine only applies to independent contractors in certain limited circumstances defined by the Act. *See Aitken, Hazen, Hoffman, Miller, P.C. v. Empire Construction Co.*, 542 F.Supp. at 256-58. Those circumstances are not present in this case, and therefore the works for hire doctrine

does not apply. Moreover, the agreement between Jaslow Laboratory and Strohl Systems expressly provided that the software developed for the system would "remain under [Strohl System's] ownership." (Exhibit J-2). This contractual provision supersedes any potential work for hire rights. *See* 17 U.S.C. §201(b).

The registered copyrights are valid. Strohl Systems was the owner of the rights to the initial system that was developed. It transferred the rights to Elaine Whelan and she in turn transferred them to Whelan Associates. The enhancements and updates were authored by employees of Whelan Associates.

Nothing in the contractual agreements and arrangements between or among Strohl Systems, Whelan Associates and the defendants supports the contention of the defendants that they had the right to continue to market the IBM-Series 1 computer after terminating the written agreement. Defendants seem to claim the sole and exclusive right to the program, its enhancements and derivatives. The only support for this is the statement in the Agreement of July 30, 1980 (Exhibit J-11) that Jaslow Laboratory "owns the Dentalab Package." The same sentence adds that the Dentalab Package was designed and developed by Elaine Whelan with the aid and assistance of Edward Jaslow and Rand Jaslow. The defendants do in fact own and have paid for the single copy of the original work which is embodied in their own individual computer. However, the software developed for that system remained under the ownership of Strohl Systems (Exhibit J-2). The Copyright Act expressly contemplates the separate concept of ownership of a copyright as distinct from ownership of a copy of the work:

> Ownership of a copyright, or of any of the exclusive rights under a copyright, is distinct from ownership of any material object in which the work is embodied. Transfer of ownership of any material object, including the copy or phonorecord in which the work is first fixed, does not of itself convey any rights in the copyrighted work embodied in the object. . . .

17 U.S.C. §202.

There is no doubt that a software computer system is subject to the protection of a copyright registration. By 1980 amendments to the copyrights laws "computer programs" were expressly defined and given the protection of the copyright laws. *See* 17 U.S.C. §§101, 117; *Apple Computer, Inc. v. Franklin Computer Corp.*, 714 F.2d 1240 (3d Cir.1983); *Williams Electronics v. Artic International, Inc.*,685 F.2d 870 (3d Cir.1982).

I conclude that plaintiff is the owner of valid copyrights to the Dentalab System as designed for the IBM-Series 1 computer. Plaintiff never licensed or authorized defendants, or any of them to sell or market or install such a system subsequent to defendants' termination of the Agreement between the parties by letter dated May 31, 1983 (Exhibit P-36).

Clearly, therefore, the two subsequent sales by Jaslow Laboratory to Cooper Laboratories and Myron Laboratory were willful and deliberate copyright infringements. Defendant, Jaslow Laboratory is liable for all profits it received. Although the evidence is somewhat scant, the only direct costs that Jaslow Laboratory incurred that have been satisfactorily established are set forth in finding of fact number 32.

A more difficult factual determination must be made as to whether the IBM-PC program developed by Rand Jaslow on behalf of all the defendants constitutes copyright infringement. If only the source and object codes can be the subject of copyright, obviously there would be no infringement.

The mere idea or concept of a computerized program for operating a dental laboratory would not in and of itself be subject to copyright. Copyright law protects the manner in which the author expresses an idea or concept, but not the idea itself. *Albert E. Price v. Metzner*, 574 F.Supp. 281 (E.D.Pa.1983). Copyrights do not protect ideas — only expressions of ideas. *Universal Athletic Sales Co. v. Salkeld*, 511 F.2d 904, 908 (3d Cir.1975). There are many ways that the same data may be organized, assembled, held, retrieved and utilized by a computer. Different computer systems may functionally serve similar purposes without being copies of each other. There is evidence in the record that there are other software programs for the business management of dental laboratories in competition with

plaintiff's program. There is no contention that any of them infringe although they may incorporate many of the same ideas and functions. The "expression of the idea" in a software computer program is the manner in which the program operates, controls and regulates the computer in receiving, assembling, calculating, retaining, correlating, and producing useful information either on a screen, print-out or by audio communication.

The expression of the idea embodied in a computer program is protected by the copyright laws even though it must be altered and refined to be made adaptable to different types of computers that have different methods of responding to command controls and therefore require different source codes. *See generally Apple Computer, Inc. v. Franklin Computer Corp.*, 714 F.2d 1240 (3d Cir.1983). The mere fact that the IBM-PC source code is written in BASIC rather than EDL, (as is the IBM-Series 1 source code) does not preclude the possibility of copying or copyright infringement. The idea of a computerized system to control the operations of a dental lab is not subject to copyright. The particular expression of that idea created and fixed in the plaintiff's IBM-Series 1 Dentalab system, however, is copyrightable, and the evidence demonstrates that defendants actually did copy that expression in writing the source and ojbect codes for their IBM-PC Dentcom system.

The evidence establishes that it would be very difficult if not impossible to literally translate a program written in EDL to a program written in BASIC. The evidence makes clear that transferring or converting from one computer language to another is not comparable to translating a book written in English to French. At least, it would be a very inefficient method of copying a program to attempt to work solely from the source code and literally translate it from EDL to BASIC. As I understand the evidence, in order to copy a program written in EDL for use in a computer that operates on a source code written in BASIC, one would study the method and manner that the computer receives, assembles, calculates, holds, retrieves and communicates data. This requires a study of the manner in which the information flows sequentially from one function to another. Once this is fully understood, one may copy this exact manner of operation for use

in a computer that responds to commands written in a different source code language.

Rand Jaslow contends that the system he designed for the IBM-PC was his own creation and not a copy of the IBM-Series 1, nor a "direct derivative." Plaintiff has the burden of proving that the alleged infringing IBM-PC Dentcom program was "copied" and that the "copy" is an improper appropriation. *Arnstein v. Porter*, 154 F.2d 464, 468 (2d Cir.1946); *Klitzer Industries, Inc. v. H.K. Jones & Co.*, 535 F.Supp. 1249 (E.D.Pa.1982).

Direct evidence of copying is not required. Access to the original, combined with substantial similarity, may be sufficient to prove by circumstantial evidence that the accused work is a copy of the original. *Custom Decor, Inc. v. Nautical Crafts, Inc.*, 502 F.Supp. 154, 157 (E.D.Pa.1980). Access in this case is clearly established. Not only was Rand Jaslow quite familiar with the original program — so much so that he claims co-authorship — but he also improperly acquired and had available the actual source code — again under a claim of right as owner or co-owner. It is quite clear that Rand Jaslow had and utilized the source code in his attempt to develop the IBM-PC Dentcom program. The almost complete similarity between the programs would have been impossible without direct utilization of the source code.

Rand Jaslow suggests that the IBM-PC Dentcom program was his original creation because he himself was unsuccessful in producing an effective program and finally engaged Mr. Novak, a computer expert, to make the program workable. Mr. Novak, defendants argue, did not copy the original source code. Mr. Novak's testimony however is that he merely corrected many of the mistakes and inefficiencies which Rand Jaslow had been unable to rectify. Mr. Novak did not testify or contend that he had authored the program. Whether Mr. Novak had or used the IBM-Series 1 source code is not controlling.

The evidence presented on similarities between the two programs was extensive and detailed and was carefully and accurately analyzed and summarized in plaintiff's proposed find-

ings of fact number 97 through 136 inclusive.[1] Little would be served by going over the similarities in detail. In this case both parties had an expert testify. Expert testimony as to similarity is clearly appropriate. *Arnstein v. Porter*, 154 F.2d 464, 468 (2d Cir.1946). It is difficult for one having practically no knowledge of the operation of computers and computer software systems to judge which of two experts in the field is the more credible. I conclude however that Dr. Moore, plaintiff's expert had greater knowledge as to the particular programs at issue. Dr. Hess, the defendants' expert witness, reviewed only the source and object codes of the IBM Series 1, the IBM-Datamaster and the IBM-PC Dentcom system. He never observed the computer in operation nor viewed the various screens or the user's manual. He stated he was not familiar with EDL coding. More basically, however, his comparison as to dissimilarities was between the IBM-Datamaster and the IBM-PC Dentcom systems. Plaintiff contends that the IBM-PC Dentcom is a copy of the IBM-Series 1 system—not the IBM-Datamaster system. Dr. Hess's conclusions were that although the overall structure of those systems is similar, the code in the IBM-PC Dentcom is not "directly derived" from either plaintiff's IBM-Series 1 or its IBM-Datamaster system. To the extent that Dr. Moore's testimony supports plaintiff's contentions of copying, I find his testimony more credible and helpful because of his detailed and thorough analysis of the many similarities.

One thing is readily apparent to even the most casual untrained observation of the operation of the two systems — the visual screens that are displayed are almost identical in format and even in use of abbreviations and terminology. There is credible evidence that prospective users and customers at trade

---

1. Because case law of this circuit may preclude a district judge from accepting verbatim a party's proposed findings of fact, to the extent I may do so I agree that plaintiff has proved by a preponderance of the evidence plaintiff's proposed findings of fact Nos. 97 through 136 inclusive, and adopt them as additional findings of fact. My decision in this case would however be the same, without the inclusion of such findings of fact.

shows found no substantial difference between the Dentalab computer software system and the Dentcom system, and considered them to be the same.

Finally, the evidence convinces me that Rand Jaslow, described by his own witness, Mr. Novak, as a talented but amateur programmer, lacked the ability to create on his own, or even with the help of a skilled programmer in correcting his errors, a workable system, especially one that is almost an exact duplicate of the system of Whelan Associates. As Dr. Moore stated, the person who wrote the IBM-PC Dentcom system had to have access to the plaintiff's Dentalab source code to be able to understand the system and to be able to use all the same sequential operations.

In advertising materials sent out by Dentcom it openly claimed the Dentcom system as the same. In Exhibit D-42 the statement is made: "At last the 'dentalab' system available under ten thousand dollars."

I conclude that the IBM-PC Dentcom system is a copy of the IBM-Series 1 Dentalab system, and that it was an improper appropriation constituting a copyright infringement. Dentcom and Rand Jaslow are liable in damages for the profits made from the sale of the 23 infringing Dentcom systems. 17 U.S.C. §504(b) provides the measure of damages as follows:

> The copyright owner is entitled to recover the actual damages suffered by him or her as a result of the infringement and any profits of the infringer that are attributable to the infringement and are not taken into account in computing the actual damages. In establishing the infringer's profits, the copyright owner is required to present proof only of the infringer's gross revenue, and the infringer is required to prove his or her deductible expenses and the elements of profit attributable to factors other than the copyrighted work.

There is evidence of the gross sales price, less the computer hardware sold. (See Finding of Fact 34). Although defendants submitted a statement of expenses (Exhibit J-5), the statement is vague and does not itemize adequately to determine whether the

claimed expenses are legitimate. Defendants have not sustained their burden of proving any expenses, and the gross profit will be awarded. It should be noted that there is testimony that the IBM-PC Dentcom System is intended to be a "shelf model," in that there are no required duties of the seller to install or "set up" the system as in the Dentalab IBM-Series 1 system that involved expenses of $1,000 to $3,000 per sale. *See Sid & Marty Krofft Television Productions Inc. v. McDonalds Corp.*, 562 F.2d 1157 (9th Cir.1977).

The infringement of the copyright was willful and deliberate. Defendants simply took the risk that their claims of co-authorship and of contractual ownership would be upheld. The Copyright Act expressly provides for costs and attorney's fees in the discretion of the trial court. 17 U.S.C. §505. Where the violation is willful and deliberate as here, attorney's fees and costs should, absent unusual circumstances, be allowed. *U.S.R. Imports, Inc. v. R.E. Greenspen Co., Inc.*, 220 U.S.P.O. 361, 374-75 (E.D.Pa.1983).

Plaintiff claims that case law interpreting the Lanham Act permits treble damages, and also punitive damages, and, in "exceptional cases" (15 U.S.C. §1117), attorney's fees and costs. No trade name of Dentalab was ever registered by plaintiff so far as the evidence discloses. I therefore find that analogy to these statutory remedies is non-persuasive. Although the name Dentlab was undoubtedly intended to and did in fact mislead the buying public, I do not find that it was a false designation of origin, description or representation within the context of 15 U.S.C. §1125.

Plaintiff contends that the use of the name Dentlab constituted a common-law unfair business practice; and that under the common law defendants tortiously interfered with contractual relationships of plaintiff with its customers and tortiously interfered with future prospective contractual relationships at least as to the sales of the IBM-Series 1 system to Cooper Laboratories and Myron Laboratory. Assuming without deciding that plaintiff has proved such causes of action, no damages have been established that could in any way be quantified or reduced to judgement, beyond those same damages that have been established

for the copyright violation. The only question is whether, in addition to compensatory damages, there should be some award of punitive damages. Plaintiff seeks substantial punitive damages.

In this case I decline to award any punitive damages. Although defendants' conduct as to the copyright infringement was willful and deliberate, the appropriating of the source code was without authorization or consent, the hiring of Joseph Cerra and utilizing him to make two infringing sales, the use of the name Dentlab by defendants, the damage that defendants caused to some of the computer programs sold by plaintiffs to its customers, and other business conduct was reprehensible and in many instances tortious, actual harm to plaintiff beyond the amount of compensatory damages to be awarded is, at best, uncertain and speculative.

Punitive damages are imposed to act as an example and to prevent similar future misconduct by the party assessed. In this case, plaintiff seeks to continue in the business of marketing its software programs to the dental laboratory industry. Defendants want to market, in competition, their IBM-PC Dentcom computer. Because I have found this to be an infringement of plaintiff's copyrights, an injunction will issue against such marketing. This, it seems to me will adequately serve the purposes that are ordinarily advanced by a punitive damage award.

Because all defendants were involved in the copyright infringement and all prospectively would gain by continued sales in the future, all will be enjoined.[2]

To the extent the Discussion portion of this opinion contains findings of fact and conclusions of law not specifically set forth under those respective headings of the opinion, they shall be deemed additions thereto.

C. CONCLUSIONS OF LAW

1. This Court has jurisdiction of the subject matter and personal jurisdiction over the parties. Venue in the district is proper.

---

2. Joseph Cerra, prior to trial, settled. No judgment or injunction will be rendered against him.

2. Whelan Associates is the sole owner of the registered copyrights to the Dentalab System; registrations TXU-131-586; TXU-139-595; TXU-319-614; and TXU-139-616. The copyrights are valid.

3. Defendants, Jaslow Laboratory and the corporate officers Edward Jaslow and Rand Jaslow willfully and intentionally infringed the copyrights of plaintiff by copying and selling IBM-Series 1 Dentalab computer systems to Cooper Laboratories of Baltimore, Maryland to Myron Laboratory of Kansas City, Kansas. The profits from these two sales were $42,099.23 for which the defendants, Jaslow Laboratory, Edward Jaslow and Rand Jaslow are jointly and severally liable.

4. Defendants, Dentcom, and its corporate officers Edward Jaslow and Rand Jaslow willfully and intentionally infringed the copyrights of plaintiff by developing, marketing and selling IBM-PC computer systems for dental laboratories under the trade name of Dentlab or Dentalab. Twenty-three such infringing sales have been made. The gross profits from such sales is $101,269, for which sum the defendants Dentcom, Edward Jaslow and Rand Jaslow are jointly and severally liable. Defendants have not proved any deductible expenses.

5. On accounts arising between the parties on the agreement in existence prior to its termination on May 31, 1983, Whelan Associates owes Jaslow Laboratory the sum of $16,829, which shall be set off against the amount of damages owed by Jaslow Laboratory.

6. The use of the word Dentlab in connection with the marketing dental laboratory software computer programs and equipment is confusingly similar to the use of the word Dentalab in the marketing of similar products. Plaintiff has the right to continue to use the name Dentalab in connection with its marketing of computer software for the dental laboratory industry to the exclusion of defendants' use of Dentlab or Dentalab.

7. The name "Dentalab" is a valid trade name, it is not a generic descriptive word. Plaintiff is entitled to prospective injunctive relief against all defendants from continued copyright infringement by means of marketing the IBM-PC Dentcom system and prospective injunctive relief agaist all defendants from

continued use of the word Dentlab in connection with marketing and selling computer software to the dental laboratory industry.

8. Plaintiff is entitled to counsel fees and costs.

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF PENNSYLVANIA

WHELAN ASSOCIATES, INC.	:	CIVIL ACTION
	:	
v.	:	
	:	
JASLOW DENTAL LABORATORY, INC., ET AL.	:	NO. 84-4583

ORDER AND FINAL JUDGMENT

For the reasons set forth at the conclusion of the hearing on the application for a preliminary injunction, and for the reasons set forth in the "Discussion" and upon the Findings of Fact and Conclusions of Law filed with the opinion accompanying this Order, it is

ORDERED, ADJUDGED and DECREED as follows:

1. Judgment is entered in favor of the plaintiff, Whelan Associates, Inc. and against the defendants, Jaslow Dental Laboratory, Inc., Edward Jaslow and Rand Jaslow jointly and severally in the sum of $25,270.23 (being $42,099.23 damages on plaintiff's complaint, less $16,829 set-off on defendants' counterclaim).

2. Judgment is entered in favor of the plaintiff, Whelan Associates, Inc. and against the defendants, Dentcom, Inc., Edward Jaslow and Rand Jaslow, jointly and severally in the sum of $101,269.00.

3. The defendants, Jaslow Dental Laboratory, Inc., Dentcom, Inc., Edward Jaslow and Rand Jaslow, jointly, severally and individually, and all other persons working in concert with them or any of them, are permanently enjoined and restrained from doing or attempting to do, either directly or indirectly, any of the following acts:

a. Marketing, advertising, selling, leasing, or licensing the IBM-PC Dentcom, Inc., software computer program or system for use in or in connection with the operation of any

dental laboratory, or any derivative, addition, enhancement or improvement to said system, including any and all accessories, instruction manuals, use guides and similar related items.

b. Using in any way the name Dentlab in connection with any product used in any way in or as a part of a computer software program or system for use in or in connection with the operation of any dental laboratory.

c. Representing in any way to anyone that they or any of them are a continuation or successor to any business of Whelan Associates, Inc.

d. Marketing, advertising, selling, leasing or licensing under any name or designation whatsoever the Dentalab Package, the IBM-Series 1 Dentalab Package, the IBM-Datamaster 26 Dentalab Package or the IBM-PC Dentalab Package including any and all enhancements and improvements, to any dental laboratory except upon express written consent and authorization from Whelan Associates, Inc.

e. Using, copying, selling, leasing or licensing in any way the source or object code to any Dentalab Package, including the IBM-Series 1, IBM-Datamaster IBM-PC Dentalab Package and system, except that defendants may continue to use, in connection with the business of operating its own dental laboratory, the IBM-Series 1 Dentalab Package originally acquired from Strohl Systems, Inc., and its present enhancements and improvements. Any source or object code to said programs or copies or portions thereof in the possession of any of the defendants shall be delivered to Whelan Associates, Inc., within ten days from the date of this judgment.

4. Defendants shall pay plaintiff's costs and counsel fees. If the parties cannot agree upon the amount of counsel fees, plaintiff shall submit within 30 days from the date of this Order a

motion for counsel fees conforming to the substantive requirements for applications for counsel fees as defined by the Court of Appeals for the Third Circuit in various case law.

5. The parties may by signed written agreement and stipulation filed with the Court from time to time agree and stipulate amendments, additions, and deletions to this decree as to the injunctive relief granted.

BY THE COURT:

_____

Donald W. VanArtsdalen, J.

January 21, 1985

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF PENNSYLVANIA

WHELAN ASSOCIATES, INC.	:	CIVIL ACTION
	:	
v.	:	
	:	
JASLOW DENTAL LABORATORY, INC., et al.	:	NO. 83-4583

MEMORANDUM OPINION AND ORDER

VANARTSDALEN, J. **May 9, 1985.**

By opinion and order dated January 22, 1985, 609 F.Supp. 1307. I determined that defendants willfully and intentionally infringed plaintiff's copyrights to certain computer software programs. Judgment was entered against all defendants, damages were assessed and plaintiff was awarded counsel fees and costs. Thereafter, both sides filed a series of motions, briefs and responses.

Defendants moved to set aside the findings of fact, conclusions of law and judgment, and to grant a new trial or amend the findings, conclusions and judgment whereby judgment would be entered for defendants. Plaintiff also filed a motion to amend the judgment seeking a further accounting, prejudgment interest and a slightly increased award of damages. Plaintiff's counsel filed a motion to award counsel fees of $187,568.91 plus $14,537.90 in costs. All motions are vigorously contested by the opposite party. Further complicating the matter, following the January 22, 1985 order and judgment, defendants obtained new counsel — this being the third law firm that defendants have utilized in this action — who belatedly, on March 15, 1985, filed a brief on the motion for a new trial that addresses issues not raised in the timely filed motion.

Plaintiff's motion seeks a further accounting for the Dentcom IBM-PC licenses sold after the last day of the trial, July 11, 1984. The plaintiff is entitled to such an accounting, and the

judgment will be amended to require one. I note that this will further delay final disposition of this case, thereby delaying the time when this case may be ripe for appellate review. Considering the apparently limited practical effect much of this litigation will have, the litigation appears to be an exercise in mutual destruction. Nevertheless, this additional accounting is proper if my prior determination as to liability is correct.

Plaintiff seeks both postjudgment and prejudgment interest. Postjudgment interest is granted as a matter of course pursuant to 28 U.S.C. §1961. I doubt that it is necessary that the judgment specifically state that it will bear interest, because postjudgment interest is nondiscretionary. *White v. Bloomberg*, 360 F.Supp. 58 (D. Md. 1973), *aff'd*, 501 F.2d 1379 (4th Cir.1974); *Blair v. Durham*,139 F.2d 260 (6th Cir. 1943). The rate of interest would be established as required by 28 U.S.C. §1961(a). The judgment will be amended to specifically require postjudgment interest.

I decline to award prejudgment interest in this case. *Duplate Corp. v. Triplex Safety Glass Co.*, 298 U.S. 448, 56 S.Ct. 792, 80 L.Ed. 1274 (1936), established the common-law rule for patent cases that prejudgment interest is generally awarded from the date on which damages become liquidated, but may be awarded from the date of infringement, even in the absence of liquidation, if there are "exceptional circumstances." *General Motors Corp. v. Devex Corp.*,461 U.S. 648, 103 S.Ct. 2058, 76 L.Ed.2d 211 (1983), reaffirmed that in patent cases the federal common-law rule precluded prejudgment interest on unliquidated damages except where there was bad faith or other exceptional circumstances. By analogy, the same rule would appear to apply for copyright infringement.

There is no statutory provision for prejudgment interest in copyright cases, as there now is in patent cases. Although there are some elements of bad faith and misconduct by defendants, I do not find exceptional circumstances warranting an award of prejudgment interest. In addition, plaintiff has suggested no practical way in which such interest could be computed; *i.e.*,upon what amounts and from what dates.

Plaintiff requests that the set-off allowed defendants be reduced by $3,500 by reason of testimony provided by plaintiff's principal witness, Elaine Whelan. This is a factual issue, which I have determined in favor of defendants. Although finding of fact 33 may inaccurately state that defendants' claimed set-off was not disputed, defendants did present credible evidence as to the amount of commissions owed to them.

Defendants' requests and motions to amend findings, conclusions and the judgment all center around their basic contentions of noninfringement. I have found to the contrary. The findings are, to the best of my ability, based upon the evidence of record. Defendants' post-trial motions do not persuade me to change the findings, the conclusions or the judgment as to liability.

The primary issue to be decided upon the post-trial motions is the right to counsel fees and costs. As a part of the judgment entered on January 22, 1985, plaintiff was awarded costs and counsel fees. Plaintiff in its post-trial requests for judgment sought as part of its relief that it be awarded "its costs and attorney's fees incurred in connection with this action and the dismissed Montgomery County [state court] action." Plaintiff's post-trial brief contained only a single short paragraph on its claim for attorney's fees wherein plaintiff made the somewhat gratuitous suggestion that because "litigation costs far exceed any profits made on sales of the system" unless attorney's fees were awarded, plaintiff "will have gained little."

So far as I can presently ascertain from reviewing the very extensive post-trial motions and briefs, defendants presented no argument against awarding counsel fees to the prevailing party. However, because defendants consistently maintained that they did not infringe any copyright and were not liable to plaintiff, defendants logically contended that they should be the prevailing party. Had I so ruled, obviously defendants would not have been liable to plaintiff for attorney's fees.

Following entry of judgment, plaintiff filed an application for $187,568.91 in attorney's fees plus $14,537.90 costs.[1] Ostensibly, the fee petition was filed in accord with the requirements of the Third Circuit Court of Appeals as announced in *Lindy Brothers I* and *Lindy Brothers II* and their progeny. *Lindy Brothers Builders, Inc. v. American Radiator & Standard Sanitary Corp.*,487 F.2d 161 (3d Cir.1973) (*Lindy Bros. I*) and 540 F.2d 102 (3d Cir.1976) (*Lindy Bros. II*).

Not surprisingly, defendants vigorously oppose the application for attorney's fees and costs, both as to amount and as to the right to the award of any attorney's fees in this case. In light of the lack of briefing by either party on the issue of entitlement prior to the entry of judgment, I will reconsider so much of the prior decision as awarded counsel fees and costs.

Section 505 of the Copyright Act, 17 U.S.C. §505, provides:

> In any civil action under this title, the court in its discretion may allow the recovery of full costs by or against any party other than the United States or an officer thereof. Except as otherwise provided by this title, the court may also award a reasonable attorney's fee to the prevailing party as part of the costs.

Under prior copyright law, the award of full costs other than attorney's fees was mandatory. *Marks v. Leo Feist, Inc.*, 8 F.2d 460, 461 (2nd Cir. 1925); *Amsterdam v. Triangle Publications, Inc.*, 189 F.2d 104 (3d Cir. 1951). Under the present statute, however, costs are discretionary, and, presumedly, could in appropriate circumstances be awarded to the losing, rather than the prevailing, party. *Kepner-Tregoe, Inc. v. Carabio*, 203 U.S.P.Q. 124 (E.D. Mich. 1979). Attorney's fees, however, may only be awarded to the prevailing party. There is little case law

1. Defendants' brief in response to the application for attorney's fees asserts (p. 23) that this sum, if granted in full, would appear to make such fee the second largest ever awarded under the Copyright Act, the largest being in *Landsberg v. Scrabble Crossword Game Players, Inc.*, 212 U.S.P.Q. 159 (C.D.Cal.1980), *vacated*, 736 F.2d 485 (9th Cir.), *cert. denied*, ___U.S. ___, 105 S.Ct. 513, 83 L.Ed.2d 403 (1984). Whether this is correct has no bearing on the decision in the present case.

to provide sure guidance as to the factors that should be considered in determining whether to award costs and attorney's fees.

Professor Nimmer in his treatise on copyright law, 3 *Nimmer on Copyright*, §14.10(D), states:

> On the other hand, an attorney's fee may not be awarded if the losing party was driven to litigation by an over-technical position taken by the prevailing party, or if a novel or complex question of law is involved and the losing party is acting in good faith.

Obviously, the "over-technical position" has no application to this case. However, both parties in extensive briefs, during the trial and during oral arguments, consistently stressed that both the factual and legal issues were novel and complex. Certainly, the basic issues of what constitutes infringement of a computer program, and the methods of proof of infringement are not clearly defined by pre-existing case law. Is the property that is subject to copyright protection solely the source code that is registered with the copyright office, or does it include the manner in which the source code, in combination with the object code, controls and operates the functions of the computer? These, and similar issues explore relatively new areas of copyright law. They constitute novel and complex issues.

Wholly apart from copyright law, the case presented difficult and complex factual issues essential to determining contractual relationships between the parties. Defendants have consistently maintained that by reason of various contractual and business relationships with plaintiff and third parties, extending over a period of years, defendants were either the sole owners or the co-owners and co-authors of the source code and computer program that was copyrighted by plaintiff. Although I ruled against such claims by defendants, these defenses were neither frivolous nor dilatory.

I ruled that the infringement by defendants was willful and deliberate in the sense that the actions taken by defendants were done knowingly and intentionally, and with full knowledge of plaintiff's claim of exclusive ownership of the computer system.

Most cases have required that there be some element of bad faith in the actions taken or in the litigation posture of a losing party before it is saddled with the opponent's counsel fees. Bad faith usually involves some action taken while subjectively recognizing that such action is tortious, illegal or otherwise wrongful. I found that defendants' conduct was violative of plaintiff's copyrights; that Rand Jaslow, the primary actor on behalf of the defendants, surreptitiously and without authority took possession of a copy of the source code; and that "other business conduct [of the defendants] was reprehensible and in many instances tortious." Nevertheless, I conclude that the defendants, throughout this dispute between the parties, relying in no small measure upon competent legal advice, sincerely believed that they were legally entitled to take the actions which they took, at least as to the copyright infringement claims.

In *Roy Export, etc. v. Columbia Broadcasting System*, 503 F.Supp. 1137, 1155 (S.D.N.Y. 1980), *aff'd*, 672 F.2d 1095 (2d Cir.), *cert denied*, 459 U.S. 826, 102 S.Ct. 60, 74 L.Ed.2d 63 (1982), the court denied a prevailing plaintiff an award of attorney's fees even though the court determined that (1) the infringement by CBS was deliberate; (2) CBS clearly increased plaintiff's expense of litigation by delaying tactics and uncompromising positions; and (3) plaintiffs assumed substantial risk and expense in presenting the action. In addition, the jury awarded punitive damages which arguably established "bad faith." The court ruled:

> In deciding whether an award of attorney's fees is appropriate, a determination of bad faith depends not only on whether a defendant deliberately used copyrighted material which it had been denied permission to use, but also on whether the defendant genuinely believed that, nevertheless, it had the legal right to make such use.

If that is the proper test, plaintiff in this case should not be awarded counsel fees.

The net result of my analysis of the existing case law and the facts of this case lead me to conclude that an award of attorney's fees would not be appropriate in this case. The classic American

common-law rule requires each side to bear its own counsel fees. *Alyeska Pipeline Service Co., v. Wilderness Society*, 421 U.S. 240, 247, 95 S.Ct. 1612, 1616, 44 L.Ed.2d 141 (1975). Congress has permitted the courts, in their discretion, to award counsel fees to the prevailing party, but this does not mean that such should routinely be granted. *See Encyclopedia Britannica Education Corp. v. Crooks*, 542 F.Supp. 1156, 1186-87 (W.D.N.Y. 1982); *Boz Scaggs Music v. KND Corp.*, 491 F.Supp. 908, 915 (D. Conn. 1980); *Kepner-Tregoe, Inc. v. Carabio*, 203 U.S.P.Q. 124, 139 (E.D. Mich. 1979).

Section 411 of the Copyright Act, 17 U.S.C. §411, provides that, in an action for copyright infringement of the type alleged in the complaint, an action may not be maintained "until registration of the copyrighted claim has been made." Section 412 of the Act, 17 U.S.C. §412, provides that in such an action no attorney's fees shall be made for:

> (1) any infringement of copyright in an unpublished work commenced before the effective date of its registration; or
>
> (2) any infringement of copyright commenced after first publication of the work and before the effective date of its registration, unless such registration is made within three months after the first publication of the work.

The first copyright registration was filed August 6, 1983 (finding of fact 18). Defendants contend that the court's findings have determined that "infringement commenced" before August 16, 1983, and that the copyright was not registered until more than three months after the computer system was first "published" by being fixed in a usuable computer program. Consequently, defendants contend that attorney's fees are affirmatively precluded by statute. Defendants argue, therefore, that the court has no basis for the exercise of the discretion provided under 17 U.S.C. §505 as to attorney's fees.

It is far from clear from the record when the first infringement "commences." Dentcom, Inc. was formed on August 1, 1983 (finding of fact 23), and at "about that time, Dentcom, Inc.

started to advertise and aggressively market infringing copies of the Dentalab system." (findings of fact 29 and 31). Rand Jaslow, the person primarily responsible for the infringements, developed the infringing IBM-PC system over several months starting around January 1, 1983. In mid-August, 1983 there was an infringing sale of a license to Cooper Laboratories by the defendants. (finding of fact 31 and trial transcript 2.57).

Plaintiff filed its first copyright claims on August 16, 1983, for the purpose of litigation and in order to comply with 17 U.S.C. §411. Plaintiff has been granting licenses on its Dentalab system for several years prior to registration. Consequently, whether the Dentalab system is treated, for purposes of 17 U.S.C. §412, as an unpublished or a published work it would appear that there was at least one act of infringement by defendants prior to the copyright being registered. If treated as a published work, by reason of the source code being incorporated into the computer, the first publication obviously took place far more than three months prior to the registration of the copyright.

Plaintiff, apparently recognizing that the late registration of the copyright may bar all right to attorney's fees, makes two arguments that defendants' infringement did not commence prior to the registration. Neither argument is valid.

In somewhat of a reversal of positions, plaintiff asserts that there was but a single license sold by defendants prior to the copyright registration. This sale, plaintiff contends, was to install an experimental model (a so-called Beta site) that was different from the later, improved infringing programs. I find that the license that was sold was an infringement, even though later infringing programs may have had improvements. No case law suggests that an infringer may, with impunity, market an experimental, albeit infringing, computer program. The sale by defendants, prior to plaintiff's copyright registration, was the "commencement" of infringement.

Plaintiff's second contention is that the sale of each license is a discrete infringement. According to this contention, even if there were prior sales and infringement before the copyright registration, such did not constitute the "commencement" of infringement as to the later license sales. In other words, plaintiff

contends that 17 U.S.C. §412, in the context of this case, would bar only attorney's fees for the separate infringement or infringements that occurred prior to the date of registration. Plaintiff offers no suggestion as to how such allocation of fees could be calculated.

Case law as to what constitutes the "commencement" of infringement is quite sparse. Cases seem to recognize that a simple discrete act of infringement occurring before copyright registration bars attorney's fees under 17 U.S.C. §412. *Aitkin, Hazen, Hoffman, Miller, P.C. v. Empire Construction Co.*, 452 F.Supp. 252, 267-68 (D.Neb.1982); *Streeter v. Rolfe*, 491 F.Supp. 416, 421-22 (W.D.La.1980). Unquestionably, one of the purposes of the present copyright act was to encourage registration. *See* H.R. Rep. No. 1476, 94th Cong., 2d Sess. 158, 1976 U.S. Code Cong. & Adm. News 5659, 5774. The award of statutory attorney's fees replaces the common-law rule against allowances of fees. Interpreting "commencement of infringement" as the time when the first act of infringement in a series of on-going discrete infringements occurs (*i.e.*, the first infringing sale in a series of on-going separate sales) would best promote the early registration of a copyright. It would strongly encourage prompt registration.

It is my conclusion that the infringement by defendants, for which this action was successfully maintained by plaintiff, commenced prior to August 16, 1983, the registration date of the copyright in question. Although there were other and continuing acts of infringement of copyright after Ausust 16, 1983, for which plaintiff was entitled to an award of its actual proved damages, attorney's fees are precluded by 17 U.S.C. §412.

Finally, it should be noted that, even if attorney's fees and costs would be appropriate in this case, plaintiff's application in its present form would have to be rejected. Plaintiff seeks, in its application, attorney's fees (and possibly costs) in connection with a civil action litigated in state court between the parties, which plaintiff asserts is identical to defendants' counterclaim in this action. Regardless of whether the court might have the discretionary right to include such fees in an award of attorney's fees, I would not do so in this case. The attorney's fees award

provision under the Copyright Act should, except possibly in very unusual circumstances, be limited to attorney's fees incurred in that federal litigation. The fee petition does not specify, segregate or allocate in any way the division of time and services rendered between the federal action and the state action. Therefore, the fee petition cannot be approved in its present form in any event.

I conclude that attorney's fees and costs will not be awarded in this case. Section 412 of the Copyright Act, 17 U.S.C. §412, precludes the award of attorney's fees. Alternatively, for the reasons heretofore stated, I decline to award attorney's fees and costs, to the extent that the court has the discretionary right to do so.

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF PENNSYLVANIA

WHELAN ASSOCIATES, INC.	:	CIVIL ACTION
	:	
v.	:	
	:	
JASLOW DENTAL LABORATORY, INC., et al.	:	NO. 84-4583
	:	

ORDER

Upon consideration of the outstanding post-trial motions and the briefs of the parties, it is, for the reasons stated in the foregoing memorandum, Ordered as follows:

1. Defendants' motion to set aside the findings of fact, conclusions of law and judgment, and/or to amend the same, is denied.

2. Defendants' motion for judgment in favor of defendants is denied.

3. Defendants' motion for a new trial is denied.

4. Plaintiff's motion for an accounting from defendants for all Dentcom IBM-PC and/or IBM-Series I licenses sold from the last day of trial on July 11, 1984, until the date of this order is granted. Defendants shall provide a verified, full and complete accounting, within twenty (20) days from the date of the filing of this order, as to all such sales and/or licensing agreements, including dates, parties and contract prices, terms and conditions.

5. Plaintiff's motion and application for an award of full costs and counsel fees is denied.

6. Postjudgment interest at the legal rate as established by 28 U.S.C. §1961 shall be added to the judgment until date of payment.

7. All other motions to amend the findings of fact, conclusions of law and the judgment are denied.

BY THE COURT:

_____

Donald W. VanArtsdalen, J.

May 9, 1985.

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF PENNSYLVANIA

WHELAN ASSOCIATES, INC., Plaintiff,	:	
v.	:	Civil Action No. 83-4583
JASLOW DENTAL LABORATORY, INC., DENTCOM, INC., EDWARD JASLOW and RAND JASLOW, Defendants.	:	

SUPPLEMENTAL ORDER AND FINAL JUDGMENT

Pursuant to stipulation among the parties, the Order and Final Judgment entered January 24, 1985 (as modified by the Order entered May 10, 1985), copies of which are attached hereto and made a part hereof, is supplemented without admission of liability by the defendants, as follows:

ORDERED, ADJUDGED AND DECREED:

In addition to the monetary judgment provided in paragraph 2 of the Order and Final Judgment entered January 24, 1985, judgment is entered in favor of plaintiff, Whelan Associates, Inc., and against the defendants, Dentcom, Inc., Edward Jaslow and Rand Jaslow, jointly and severly [sic] in the sum of $15,000.

By the Court: _____
Donald W. VanArtsdalen, J.

November 14, 1985

SO STIPULATED:

Dated:

November 13, 1985

JOEL S. GOLDHAMMER, ESQ.
Seidel, Gonda, Goldhammer
& Abbott, P.C.
1800 Penn Center Plaza
Philadelphia, PA 19102
(215) 568-8383
Attorney for Plaintiff

Dated:

September 18, 1985

ROBERT S. BRAMSON, ESQ.
Schnader Harrison Segal & Lewis
Suite 3600
1600 Market Street
Philadelphia, PA 19103
(215) 751-2000
Attorney for Defendants

UNITED STATES COURT OF APPEALS
FOR THE THIRD CIRCUIT

85-1358

WHELAN ASSOCIATES, INC.

v.

JASLOW DENTAL LABORATORY, INC.,
DENTCOM, INC., EDWARD JASLOW,
RAND JASLOW, and JOSEPH M. CERRA

Jaslow Dental Laboratory, Inc.,
Edward Jaslow, Rand Jaslow, and Dentcom, Inc.,
Appellants

On Appeal from the United States District Court
for the Eastern District of Pennsylvania
(D.C. Civ. No. 83-4583)

Present: GIBBONS, BECKER and ROSENN, *Circuit Judges*

JUDGMENT

This cause came to be heard on the record from the United States District Court for the Eastern District of Pennsylvania and was argued by counsel March 3, 1986.

On consideration whereof, it is now here ordered and adjudged by this Court that the judgment of the said District Court entered January 24, 1985 and the order entered May 10, 1985, be, and the same are hereby affirmed. Costs taxed against the appellants.

ATTEST:

Chief Deputy Clerk

August 4, 1986

UNITED STATES COURT OF APPEALS
FOR THE THIRD CIRCUIT

85-1358

Whelan Associates, Inc.,

vs.

Jaslow Dental Laboratory, Inc.,

Appellants

Pursuant to Rule 41(b) of the Federal Rules of Appellate Procedure, it is ORDERED that issuance of the certified judgment in lieu of formal mandate in the above cause be, and it is hereby stayed until October 24, 1986.

Circuit Judge

Dated: Aug. 29, 1986